ESTIMATION OF GESTATIONAL AGE OF THE FETUS BY ULTRASONOGRAPHIC MEASUREMENT OF THE THICKNESS OF PLACENTA

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M.S. (OBSTETRICS & GYNAECOLOGY) - BRANCH – II

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CERTIFICATE

This is to certify that dissertation entitled **ESTIMATION OF GESTATIONAL AGE OF THE FETUS BY ULTRASONOGRAPHIC MEASUREMENT OF THE THICKNESS OF PLACENTA** is a bonafide work done by **Dr. ROSHAN JULAIKA PARVEEN.A** at R.S.R.M Lying in Hospital, Stanley Medical College, Chennai. This dissertation is submitted to Tamil Nadu Dr. M.G.R. Medical University in partial fulfilment of university rules and regulations for the award of M.S. Degree in Obstetrics and Gynaecology.

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DECLARATION

I Dr. **Dr. Roshan Julaika Parveen.A** solemnly declare that the dissertation titled, **ESTIMATION OF GESTATIONAL AGE OF THE FETUS BY ULTRASONOGRAPHIC MEASUREMENT OF THE THICKNESS OF PLACENTA is** a bonafide work done by me at R.S.R.M. Lying in Hospital, Stanley Medical College, Chennai during June 2013 – June 2014 under the guidance and supervision of Prof.**Dr.P.Vasanthamani M.D., D.G.O** Professor and Chief of the department of Obstetrics and Gynaecology.

This dissertation is submitted to the Tamil Nadu Dr. M.G.R. Medical University in partial fulfilment of University rules and regulations for the award of M.S. Degree (Branch-II) in obstetrics and Gynaecology.

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Place: Chennai
Date:

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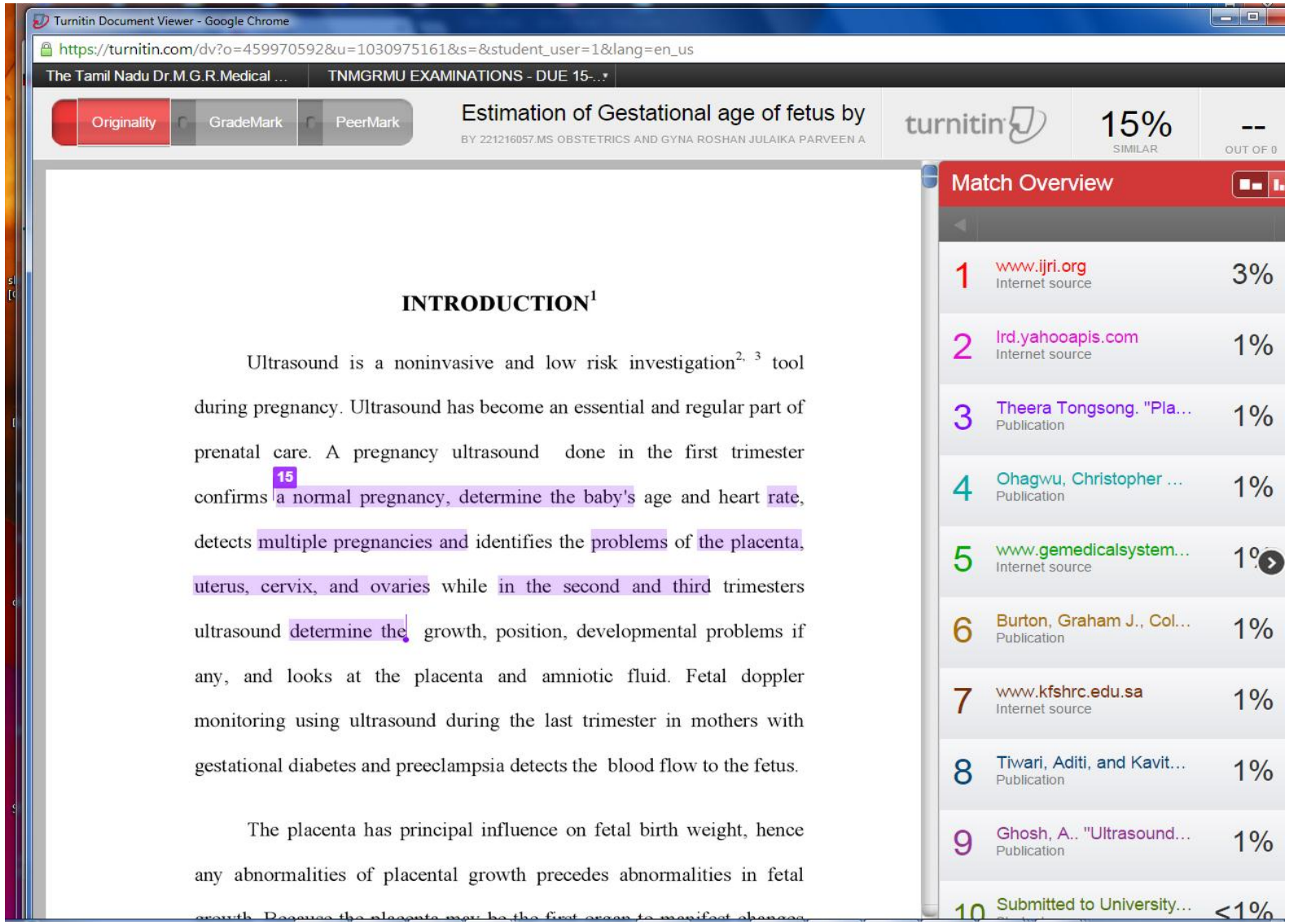
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INTRODUCTION[1]
Ultrasound is a noninvasive and low risk investigation[2, 3] tool during pregnancy. Ultrasound has become an essential and regular part of prenatal care. A pregnancy ultrasound done in the first trimester confirms a normal pregnancy, determine the baby's age and heart rate, detects multiple pregnancies and identifies the problems of the placenta, uterus, cervix, and ovaries while in the second and third trimesters ultrasound determine the growth, position, developmental problems if any, and looks at the placenta and amniotic fluid. Fetal doppler monitoring using ultrasound during the last trimester in mothers with gestational diabetes and preeclampsia detects the blood flow to the fetus.
The placenta has principal influence on fetal birth weight, hence any abnormalities of placental growth precedes abnormalities in fetal
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CONTENTS

INTRODUCTION

INTRODUCTION[1]

Ultrasound is a noninvasive and low risk investigation[2, 3] tool during pregnancy. Ultrasound has become an essential and regular part of prenatal care. A pregnancy ultrasound done in the first trimester confirms a normal pregnancy, determine the baby's age and heart rate, detects multiple pregnancies and identifies the problems of the placenta, uterus, cervix, and ovaries while in the second and third trimesters ultrasound determine the growth, position, developmental problems if any, and looks at the placenta and amniotic fluid. Fetal doppler monitoring using ultrasound during the last trimester in mothers with gestational diabetes and preeclampsia detects the blood flow to the fetus.

The placenta has principal influence on fetal birth weight, hence any abnormalities of placental growth precedes abnormalities in fetal growth. Because the placenta may be the first organ to manifest changes of disease in pregnancy, placental features may have a role in screening for pregnancy complications.

Even though the placental thickness is the easiest placental dimension to measure, a very little is known about the “normal” placental thickness as measured by ultra sonography. Historically, a placenta of greater than 4 cm in thickness has been regarded as abnormal and

associated with various poor outcomes. Placental thickness may vary with the implantation site and anterior placentas are thinner than posterior placentas, casting a categorical 4-cm cutoff highly irrelevant.

Estimation of gestational age of the developing fetus is essential in proper management of high risk pregnancies. The estimation of the expected date of delivery is necessary to interpret laboratory test, to plan and execute therapeutic measures, to determine optimal management in complicated pregnancies like IUGR, Gestational diabetes, and Rh incompatibility.

The clinical estimation of gestational age is determined by LMP, pelvic examination and date of occurrence of fetal heart sound.

In a study by Kramer et al LMP estimation were found to be inaccurate in preterm and post term deliveries.

The knowledge of LMP is the reliable indicator in establishing EDD, provided the menstrual flow is of normal duration, normal amount, prior regular periods and non usage of oral contraceptive within three months of LMP. In 30% of patients who do not fulfill these prerequisites, the LMP does not correlate with EDD.

Urine pregnancy test is also a reliable method to establish EDD.A positive pregnancy test after 4—5 weeks of amenorrhea establishes the patients EDD quite accurately.

In patients with doubtful LMP, estimation of gestational age in weeks by measuring the uterine size has to be confirmed by ultrasound examination. Hence ultrasound examination remains to be the gold standard in confirmation of the gestational age calculated by other clinical methods.

Other USG methods to measure Gestational age are

1. Placental Thickness,
2. Renal length,
3. Foot length,
4. Clavicle length.

AIM OF THE STUDY

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To evaluate the placental thickness as an ultrasonographic parameter for estimating the gestational age of fetus.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

The placenta is a materno-fetal organ that starts developing with the implantation of the blastocyst within the uterus, continues its journey with the developing fetus and gets expelled out along with the fetus at term.

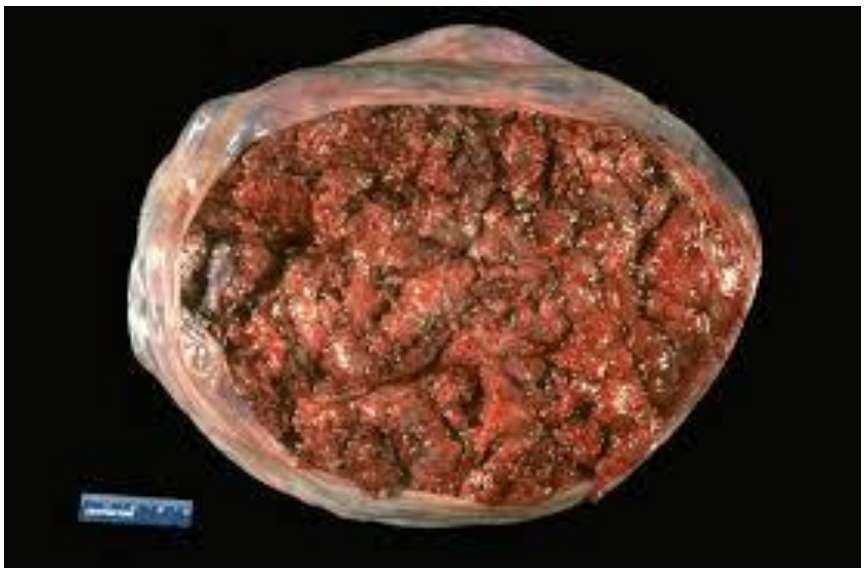
ANATOMY OF PLACENTA[4,5,6,7]

The placenta which is composed of maternal and fetal portions is the connecting link between the fetus and uterine wall.

The placenta has two components – maternal portion and fetal portion.

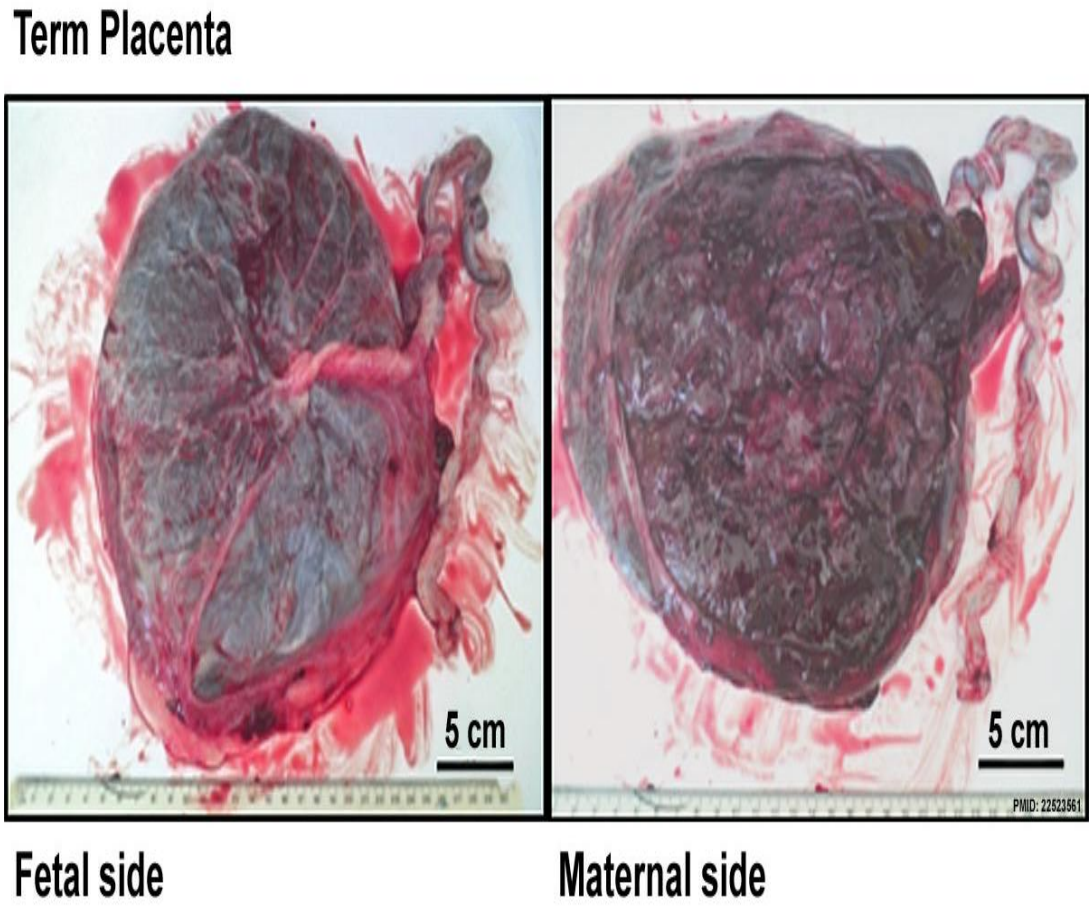
Maternal portion:

Formed by decidua basalis with intervillous spaces.



Fetal portion:

Formed by the villi of chorion frondosum. The Trophoblast and extra embryonic mesenchyme fuses to form fetal chorion.

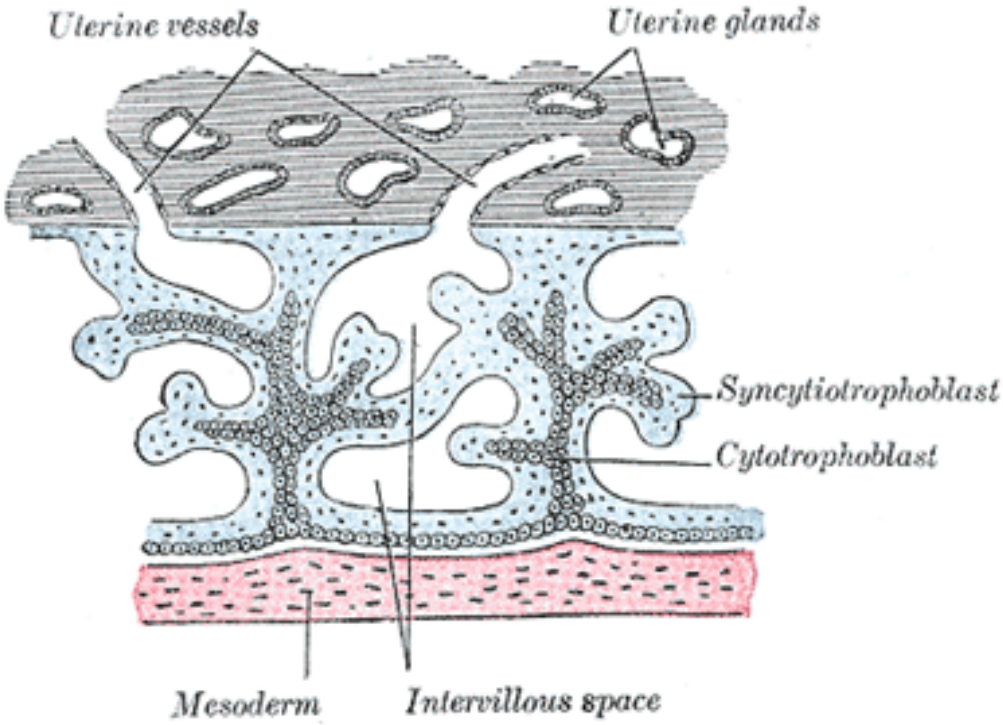


There is a four layer barrier between the maternal and fetal blood (8) consisting of fetal capillary endothelium surrounded by connective tissue which is bounded by two layer of ectodermal cells derived from trophoblast.

There are two types of trophoblastic cells namely cytotrophoblast and syncytiotrophoblast. The cytotrophoblast represent the deeper

stratum while the syncytiotrophoblast signifies the superficial stratum which is in contact with maternal blood. Chorionic villi is the functional unit of the placenta. Within the chorionic spaces are the intervillous spaces which are filled with maternal blood. As the embryo and membranes grow, the decidua capsularis is stretched. The chorionic villi on the associated part of the chorionic sac gradually atrophy and disappear (chorion leave).

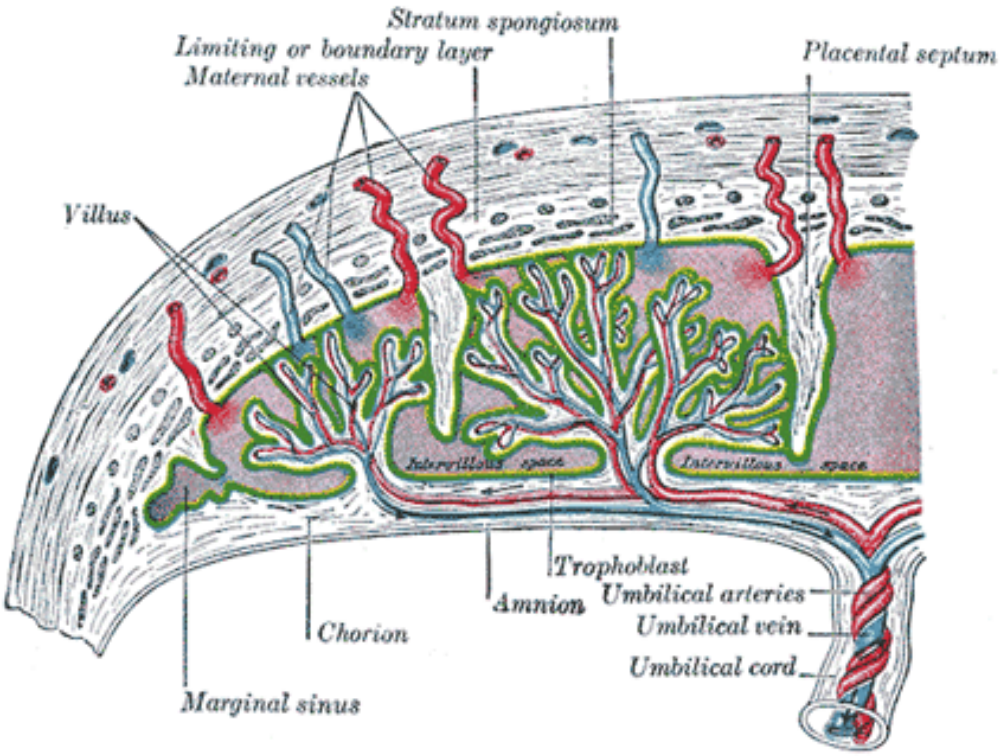
The chorionic villi on the associated part of decidua basalis rapidly increases in size and complexity (chorion frondosum).The maternal surface of the placenta which lies adjoining the deciduas basalis is called as basal plate while the fetal surface which adjoins the surrounding chorion is called the chorionic plate. The maternal and fetal circulation does not intermingle[8] as they are separated from each other by the delicate walls of the villi.



Fetal-placental- uterine circulation[9,10]

The fetal umbilical circulation begins with deoxygenated blood from fetal heart through ductus arteriosus into descending aorta. Fetal blood traverses through hypogastric arteries, umbilical arteries and end in umbilical cord. Within the placenta, umbilical arteries divide into multiple capillary branches. The placenta receives oxygenated maternal blood through spiral arteries. The exchange of oxygen and nutrients between the maternal and fetal blood occurs at the villous capillaries. Maternal blood drains[11,47] back through basilar, interlobular and marginal veins. The rate of uteroplacental flow at term is 500-600 ml per minute.

The placenta is discoid in shape, weighs about 450-500 gm[12], has a diameter of 15-20 cm, thickness of 2.5cm at the center with 15-20 lobes or cotyledons divided by fissures. The maternal surface of the placenta is rough[13] while its fetal surface is smooth. The fetal surface of the placenta is covered by a thin layer of amnion which overlies the chorion.



Placental growth[14,48]

Multiplication and branching of the chorionic villi results in increase in the size of the placenta. At 16 weeks of gestation the placenta occupies about half of the uterine cavity and as the gestation progresses the placental size decreases to occupy about one fourth of the uterine cavity.

Placental ageing[15]

Villi changes:

- The volume and prominence of cytotrophoblast decreases
- Decrease in thickness of the syncytium
- Partial disappearance of langhans cells
- Deposition of fibrin on the surface of the villi

Decidual changes:

- It undergoes fibrinoid degeneration

Intervillous spaces:

- The syncytium covering the villi undergoes fibrinoid degeneration known as White infarcts.
- Calcification occurs

Placental function[17,14]

The placenta does many important functions that include :

- Transports of water, electrolyte, oxygen and Nutrition from maternal blood to fetal blood.
- Excretes carbondioxide, urea and other waste products from fetus to maternal blood.
- Produces Hormones like Human placental lactogen and human chorionic gonadotrophin to maintain pregnancy
- Barrier function -Protects the fetus against microbes
- Immunological function[16] - Transports maternal antibodies like IgG, gamma globulin to the fetus

Umbilical cord:

- Forms the connecting link between the placenta and the fetus
- Develops from the connecting stalk which is a band of mesoblastic tissue stretching between the embryonic disc and chorion.
- Umbilical cord is made up of epithelium, whartons jelly, blood vessels, remnants of the umbilical vesicle, allantois and obliterated extra embryonic coelom.
- Measures about 50 cm in length
- Contains two arteries and one vein.

PLACENTAL SONOGRAPHY[18,19]

Ultrasound is the most sensitive, safe and simple diagnostic modality in placental screening. It not only detects the placental attachment within the uterine wall but also the abnormalities if any existing within the placenta. Latest technical advancement in ultrasonographic imaging like tissue harmonic imaging, computer sonography, colour Doppler imaging and 3D imaging has enhanced the standard of placental evaluation. The placental volume measurements are best evaluated by 3D ultrasound.

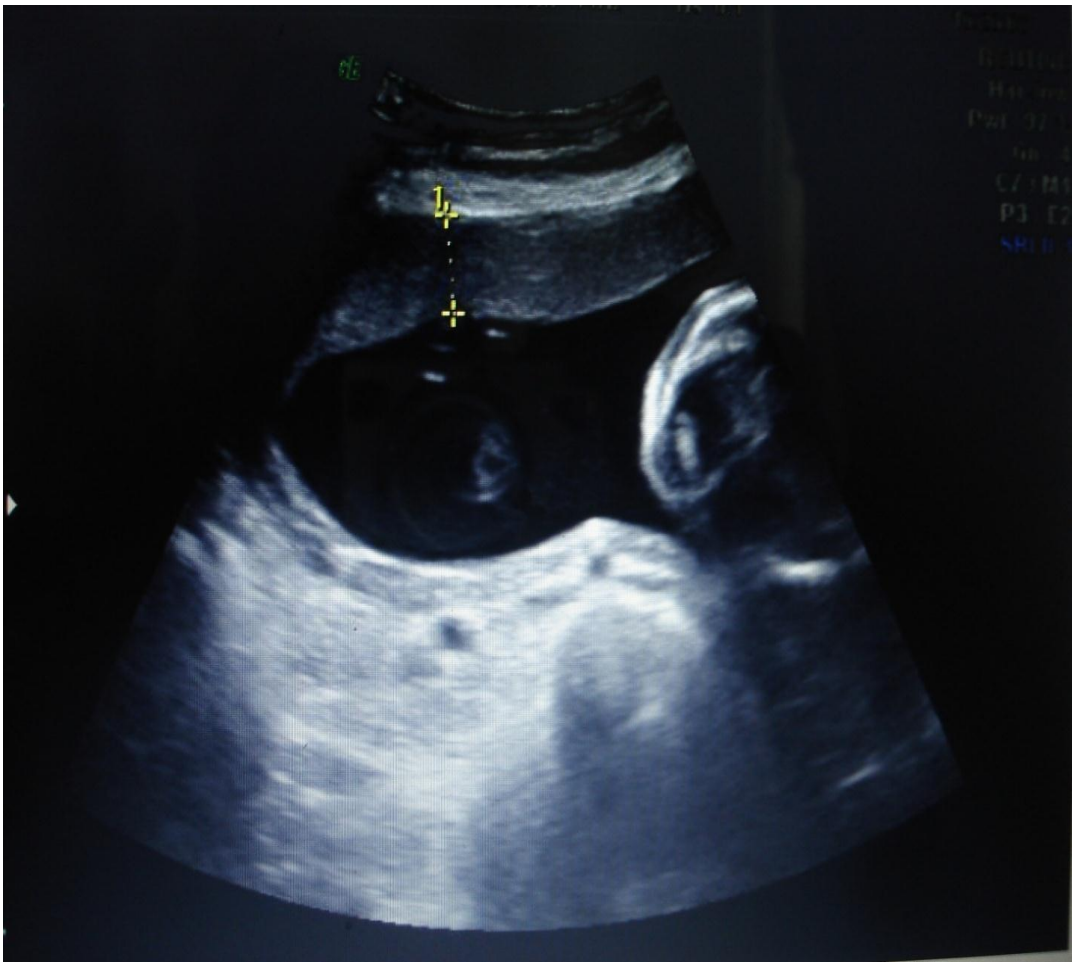
Normal sonographic anatomy [20,21,22]

- Placenta identified by transvaginal sonography--- at 5 weeks of gestation
- Placenta identified by transabdominal sonography--- at 8 weeks of gestation

The placenta consists of chorionic plate on the fetal side, basal plate on the maternal side and placental substance intervening between them. The chorionic plate with the adjacent amniotic fluid provides the strong acoustic interface resulting in distinct line of echoes. The basal plate has no specific echo pattern while the underlying retroplacental myometrium is relatively sonolucent. The placental substance has a diffuse granular echotexture. The villous tree bathed in the maternal blood in the intervillous spaces provides the echoes for sonographic evaluation.

Placental appearance:

Between 8 – 20 weeks: uniform texture



After 20 weeks: intraplacental sonolucencies (venous lakes) With calcification[23]

After 30 weeks: prominent venous plexus separates the myometrium from basal plate

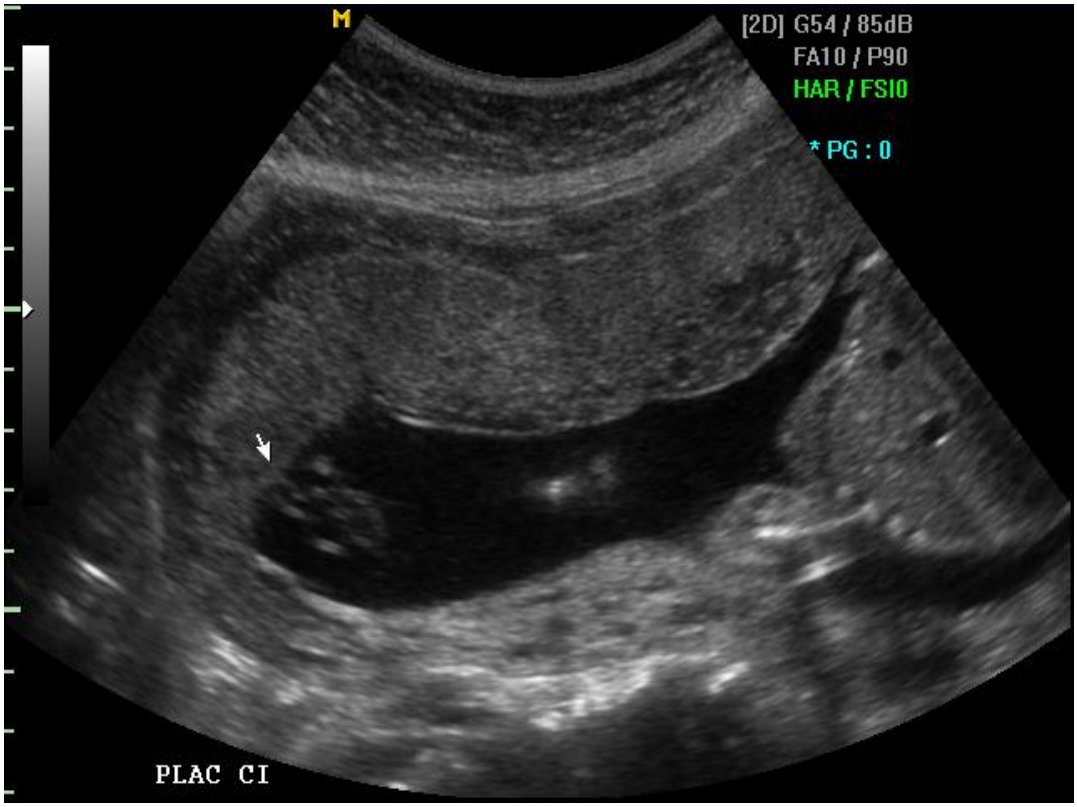
AFTER 30 WEEKS

Placental position:

Normal placental insertion involves more than one endometrial surface.

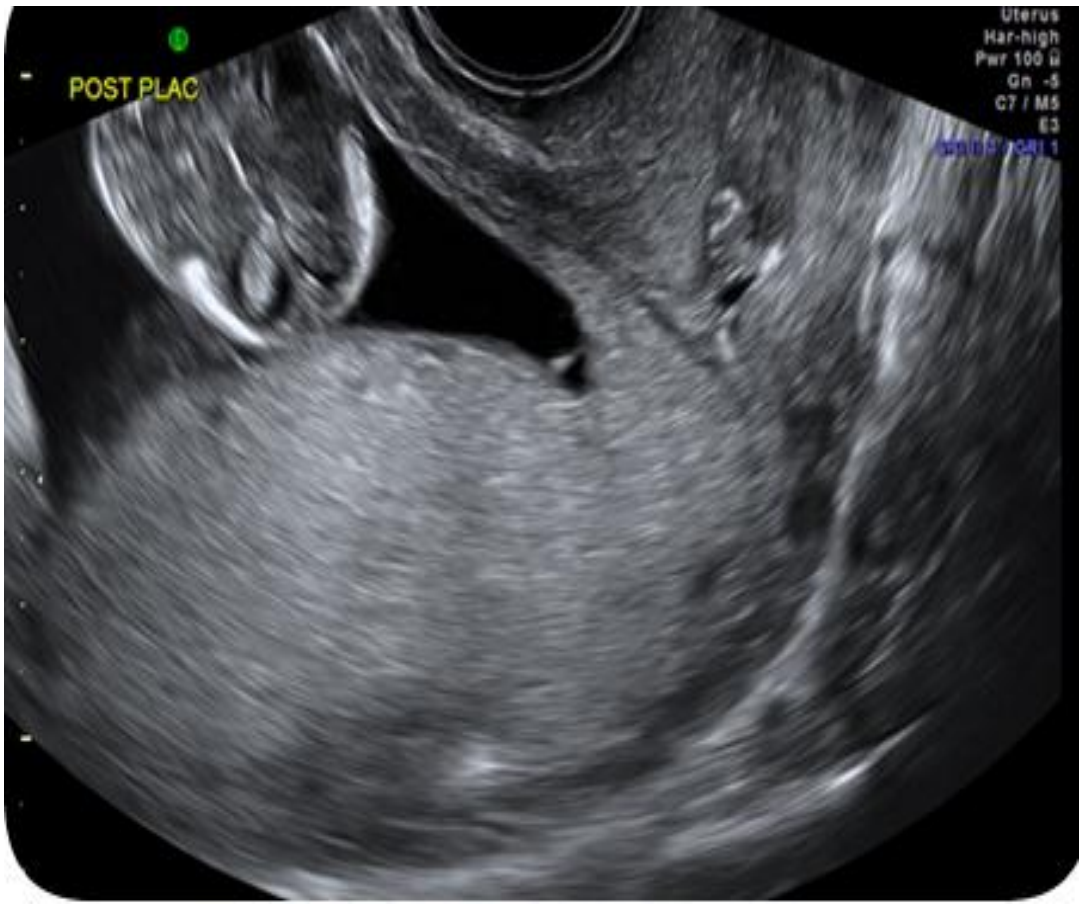
Anterior placenta:

Located principally anteriorly, may extend into lateral wall and fundus.



Posterior placenta:

Located principally posteriorly, may extend into lateral wall and fundus

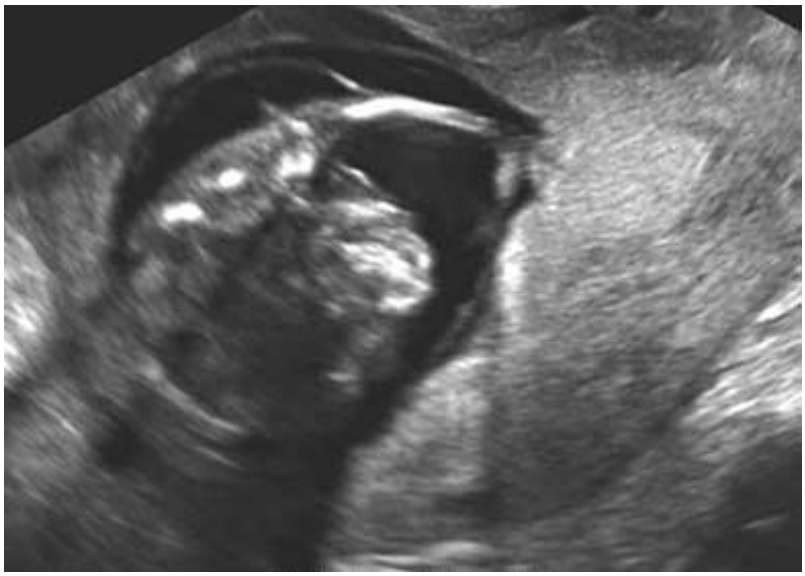


Fundal placenta:

Located principally in the uterine fundus, may extend into anterior and posterior walls

Lateral placenta:

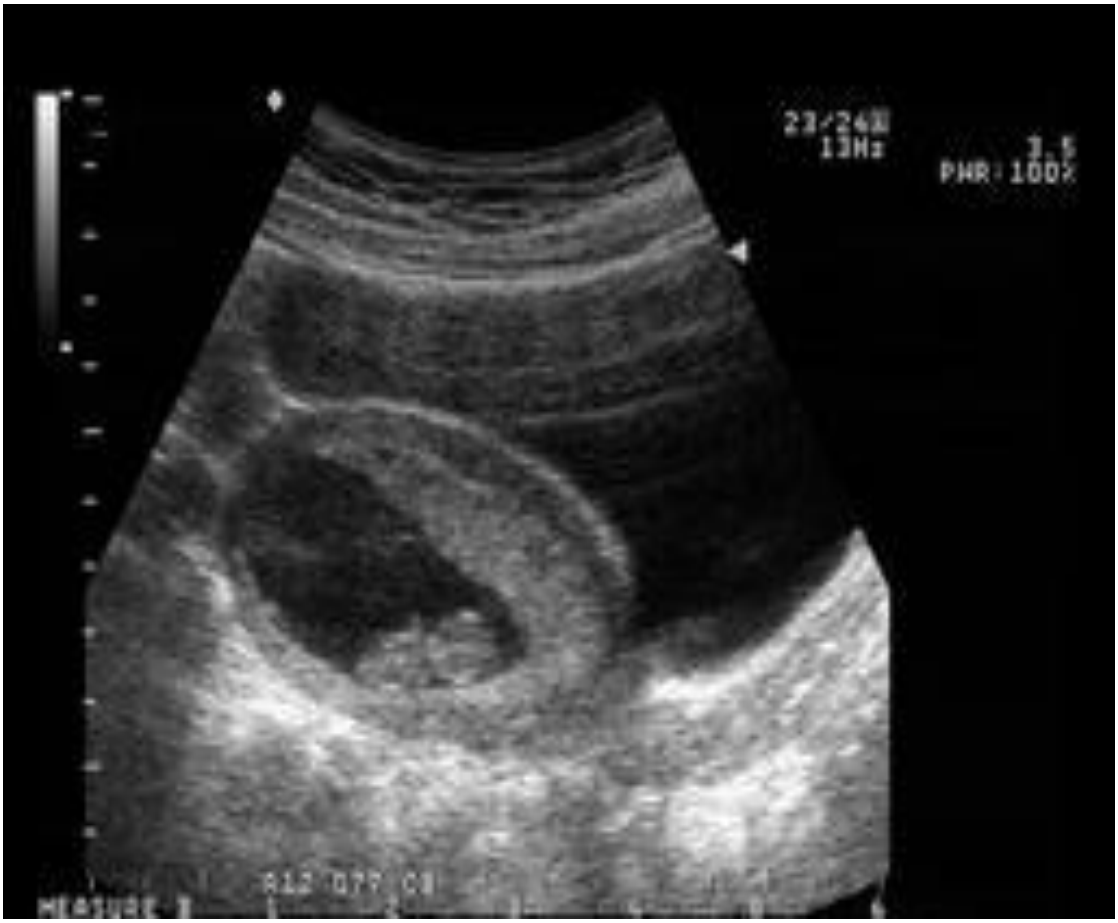
Located principally in the lateral wall may extend into anterior and posterior walls



Placental maturation:

Grannum[24] et al has classified the sonographic appearance of placenta into following grades

Grade 0: no visible calcification, smooth chorionic plate.



Grade 1: scattered tiny calcifications, subtle indentations of chorionic plate

Grade 2: larger basal and comma like echodensities, larger indentations of chorionic plate

Grade 3: extensive basal echogenicity and circular echodensities fully outlining the cotyledons, complete indentation of chorionic plate.

Placental sonographic grading system is of valuable predictive indicator of potential perinatal problems.

Placental grades of gestational age:

- Grade 1: seen around 31 weeks of gestational age
- Grade 2: seen around 36 weeks of gestational age
- Grade 3: seen around 38 weeks of gestational age

Placental Endocrinology:

Placenta is an important endocrine gland.

Two major groups of hormones are produced.

Steroid hormones – progesterone and estrogens

Peptide hormones – human chorionic gonadotrophin, human placental lactogen

All hormones are synthesized by syncytiotrophoblast.

Progestogens:

Until 9 weeks the corpus luteum produces progesterone and maintains pregnancy. After that progesterone is secreted by placenta.

Function:

To maintain quiescence of the myometrium

Immuno modulatory role

To maintain secretory activity of endometrial glands

HCG:

Detected in maternal blood and urine 8 to 10 days after fertilization.

In ‘Down syndrome’ concentration of HCG is raised.

In early onset preeclampsia – concentration of HCG is raised

Alpha subunit common to thyroid stimulating hormone, Luteinizing hormone and follicle stimulating hormone.

Beta subunit determines the biologic specificity of HCG

Placental lactogen:

Also known as chorionic somatotropin.

Homology with human growth hormone (96%) and prolactin (67%)

It promotes growth and differentiation of the mammary glandular tissue.

Placental growth hormone (PGH):

PGH has high growth promoting activity.

In IUGR, circulating levels of PGH are reduced.

Promotes lipolysis so increases circulating free fatty acid level, acts as insulin antagonist.

Abnormalities of Placenta and Cord:

There is variation in morphology including size, shape and weight of placenta. Variation of cord is common.

Placenta Succenturiata:

Incidence – 3%

One or more lobes of placenta at varying distance from the main placental margin. A leash of vessels connecting the main placenta to small, traversing through membrane.

The accessory lobe is developed from the activated villi on the chorionic leave.

Diagnosis:

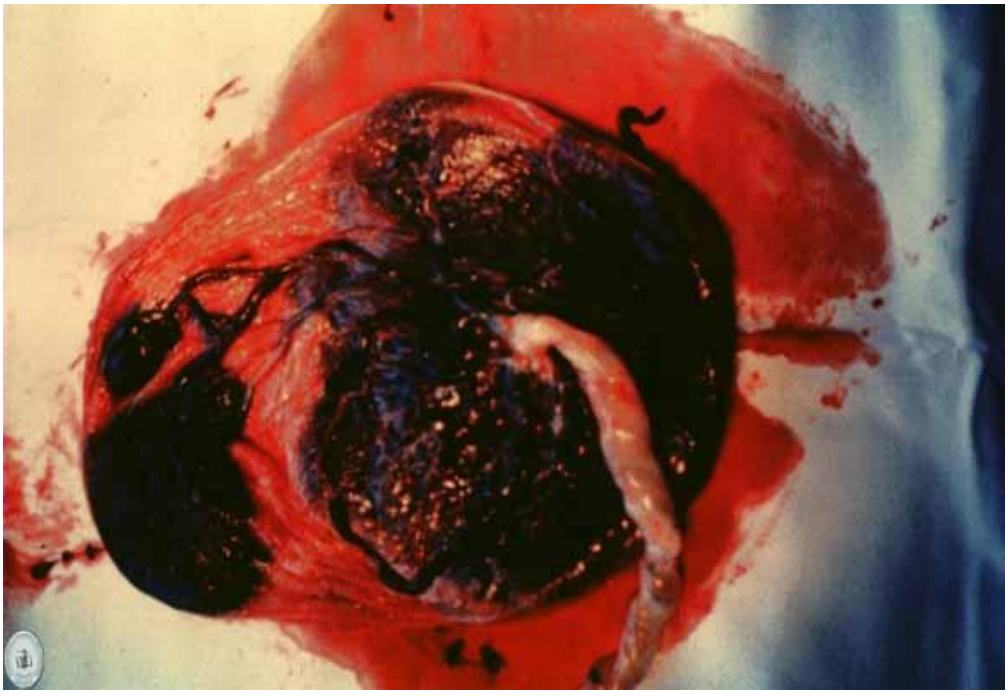
After expulsion of placenta.

Clinical Significance:

If succenturiate lobe is retained it may lead to post partum hemorrhage, sub involution ,sepsis, and polyp formation.

Treatment:

Whenever the diagnosis of missing lobe is made, exploration of uterus and removal of lobe under general anaesthesia is to be done



SUCCENTURIATA

Placenta Extrachorialis:

They are two types

Circumvallate placenta, placenta marginata.

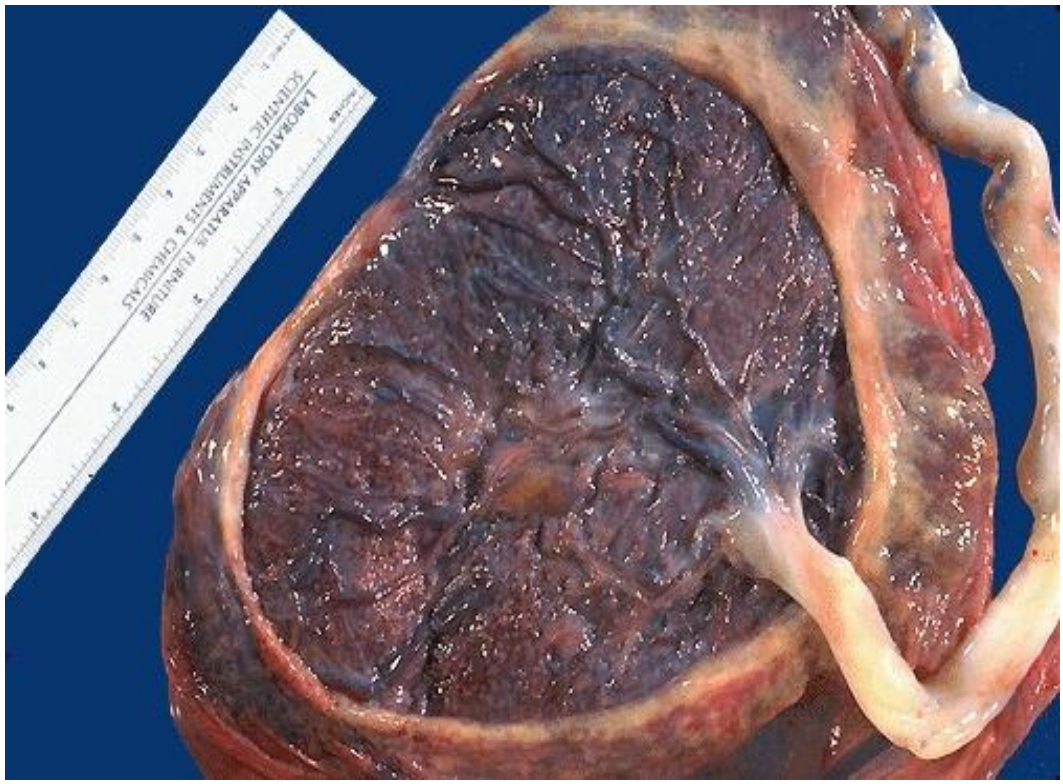
Circumvallate Placenta:

This is due to small chorionic plate than basal plate. Ultrasound shows recurrent marginal hemorrhage.

The membranes are folded and rolled back to form a ring which is centrally placed.

A rim of bare placental tissue is seen. The fetal surface has a central depressed zone surrounded by a thickened white ring which is complete. The ring is composed of a double fold of amnion and chorion with degenerated decidua (vera) and fibrin in between vessels radiate from the cord up to the ring and disappear.

The peripheral zone outside the ring is thicker and the edge is elevated and rounded.



CIRCUMVALLATE

Clinical Importance:

There is increased chance of

- Abortion
- Antepartum hemorrhage
- Preterm delivery
- Retained placenta
- Growth retardation of baby,
- Hydrorrhoea gravidarum (increased watery vaginal discharge)

Placenta Membranecea:

The placenta is very large and thin. The placenta in this condition develops from chorion frondosum and chorion leave. So the whole of the ovum is covered by placenta.

Clinical significance:

- If some part of placenta covers the lower segment it leads to placenta praevia.
- Imperfect separation in the third stage leads to post partum hemorrhage.
- Chance of retained placenta is more.

CORD ABNORMALITIES

Battle Door Placenta:

The cord is attached to the margin of placenta.

If the placenta is implanted in lower uterine segment, there is chance of cord compression in vaginal delivery leading to fetal anoxia or fetal death

Velamentous Placenta:

The cord is attached to the membranes. The branching vessels traverse between the membranes for a varying distance before they reach and supply the placenta.

Vasa praevia:

If the leash of blood vessels happen to trasverse through the membranes overlying the internal os in front of presenting part.

Management:

In the presence of fetal bleeding, urgent delivery either as vaginal or a cesarean section. If baby is dead, Vaginal delivery awaited.

Abnormal Length:

- Long cord
- Short Cord

Long Cord:

Can lead to cord prolapse, cord entanglement produce compression of cord vessels leading to fetal distress and fetal death.

Short Cord:

Length of cord < 20 cm or 8”

Clinical significance:

- Failure of external version.
- Prevent descent of the presenting part during Labor.
- Separation of normally situated placenta.
- Malpresentation

Single umbilical Artery:

- Incidence – 1 – 2%
- Common in twins, diabetic mother, Ployhydramnios
- Commonly associated with renal and genital anomalies.
- Increased chance of abortion, IUGR and increased perinatal mortality

Cord has true knot & false knot:

- True knot
- It is rare, whartons jelly protected the fetal vessels from compression.

False knots:

Are due to accmulation of whartons jelly or due to varices.

Focal cystic / hypoechoeic lesion[25]

Are present everywhere within the placenta after 25 weeks of gestation, are due to lesion resulting from maternal blood flow disturbances Such as chorionic fibrin deposition, Perivillous fibrin deposition, Intervillousthrombi, Placental infarction and maternal floor infarction.

Growth pattern of normal placenta[14]

Multiplication and branching of chorionic villi results in growth of the placenta .Placental growth can be estimated by measuring its thickness or its volume. Even though placental growth occurs throughout the pregnancy, its intensity is more rapid during the earlier weeks. Linear growth pattern is exhibited by both placental and fetal weights throughout the pregnancy except during the last few weeks when the placenta has reached a sufficient size to meet its transfer functions.

Placental thickness and gestational age[26,42]

Few authors have studied the role of placental thickness as an additional parameter for estimating the gestational age and have published nomograms

Importance of USG [38,39,40,41] at different weeks of gestation:

10 – 14 weeks

1. To confirm pregnancy and cardiac activity
2. To estimate gestational age
3. To rule out ectopic pregnancy & molar pregnancy.
4. To diagnose and evaluate multiple pregnancy.
5. To evaluate uterine anomaly and pelvic mass.
6. To measure nuchal translucency

Importance in 18 – 22 weeks scan:

1. To diagnose fetal anomalies
2. To locate placenta
3. To recognize myomas or other pelvic mass

Importance in 32 – 36 weeks scan:

1. To identify IUGR
2. Confirm presentation and position of fetus
3. Locate placenta completely
4. Asses amniotic fluid volume

Accuraccy in;

1st trimester-+/- 3 days

2nd trimester +/-1or 2 days

3rd trimester+/-2or3 weeks

FIRST TRIMESTER;

Gestational sac- 5weeks

Gestational sac+yolk sac-5.5 weeks

Gestational sac+yolk sac+embryo- 6 weeks

RELATED ARTICLES:

1. **P. Mittal et al (2002)[27]** analyzed 600 atenatal cases from 10 weeks of gestation. patients with congenital malformation, DM, PIH, Hydrops fetalis, excluded from this study, Fetal age calculated by CRL, BPD, HC, AC, FL placental thickness was measured in each case. Placental thickness increased from 15mm at 11 weeks to37.5mm at 39 weeks. From the 22nd week to 35th week of gestation the placental thickness coincide almost exactly with the gestational age in weeks.

2. **Anupama jain et al (2001)[28]** analyzed 500 cases of more than 10 weeks gestation. It was observed that the mean placental thickness increased from 15mm at 10 weeks to 36mm at 39 weeks of gestation. Placental thickness matched almost equally from 27 weeks to 33 weeks of gestation.

3. **Tongsong T[29] et al (2004)** established a nomogram for placental thickness for each week of gestational age ranged from 7—37 weeks. By regression analysis, placental thickness (in mm)= gestational age in weeks x 1.4—5.6 (r =0.82). This nomogram may be a useful aid in the early detection of placental abnormalities like hydrops fetalis.

4. **Muhammad Haneef et al** (2005) studied 100 cases of gestational age of more than 12 weeks .Placental thickness increased from 16 mm at 12 weeks to 39 mm at 40 weeks.

5. **Ghosh[30] U K et al**(1990) analysed 120 uncomplicated pregnancies of 32 to 40 weeks of gestation. Placental diameter and thickness was measured .Placental diameter increased with advancing pregnancy whereas the placental thickness decreased with increasing gestational age. In 75% of cases a single ultrasound measurement of placental thickness can predict gestational age within +/-- 14 days in the last 8 weeks of pregnancy.

6. **W.K.Hoddick[31] et al** (1985) reviewed sonograms of 200 singleton pregnancies. Placental thickness was measured and correlated with menstrual age. Placental thickness increased with advancing menstrual age. At no stage of pregnancy was the normal placenta greater than 4 cm in thickness.

7. **Grannum et al[24]** (1979) in ultrasonographic study of placenta have shown that there is gradual decrease in the thickness of placenta as the placenta matures.

8. **Bleker et al**[32] (1977) have shown that the surface area of placenta increases linearly.

9. **Nyberg and Finberg**[33] (1990) also reported that as a rule of thumb, placental thickness in mm parallels gestational age in weeks.

10. **Habib F A**[34] (2002) studied placental diameter and thickness by ultrasound at 36 weeks of gestation in 70 singleton pregnancies. A warning limit of placental diameter of 18 cm and placental thickness of 2 cm at 36 weeks of gestation were calculated to predict the low birth weight in infants. Ultrasonographic placental thickness appears to be of prognostic value in identifying the subsequent occurrence of IUGR.

11. **Elchalal U**[35] **et al** (2002) analysed 561 normal singleton pregnancies to establish the correlation of sonographically thick placenta with perinatal mortality and morbidity. Thick placenta was determined as the placenta that was above the 90th percentile. A linear increase of placental thickness was found to correlate with gestational age throughout pregnancy. Sonographically a thick placenta was associated with perinatal

risk with increased mortality related to fetal anomalies and higher rates of both SGA and LGA infants at term.

12. **Tongsong T et al**[29] (1999) evaluated the efficacy of placental thickness at mid pregnancy in predicting fetal Hb Barts disease in pregnancy at risk. Placental thickness of more than 13mm was considered abnormal for 18 to 21 weeks of gestation. Mean placental thickness for normal pregnancy and pregnancies with Hb Bart's fetuses were significantly different. For a couple at risk, if placental thickness is normal then the risk of having Hb Bart's fetus is markedly decreased.

13. **Ghosh A**[30] **et al** measured placental thickness by ultrasound at 10 to 21 weeks of gestation in 231 pregnancies at risk for homozygous alpha thalassemia. The sensitivity in detecting the affected pregnancies after 12 weeks was 0.95 and by 18 weeks was 1. Thus the selection of pregnancies at risk by measurement of placental thickness will reduce the number of invasive diagnostic procedures.

MATERIALS AND METHODS

MATERIALS AND METHODS

Source of data:

- Uncomplicated antenatal cases from antenatal clinic at the Department of Obstetrics and gynaecology, RSRM Hospital, Government Stanley Medical College, Chennai are included.

- Along with fetal biometry (BPD, FL, AC, HC) placental thickness was measured and the labor outcomes of those women were followed.

Study Design:

Period of study: 1 year (June 2013 – June 2014)

Design of study: cross sectional study

Sample size: 242 cases, 42 cases did not come for delivery to our Hospital

The dissertation studies the placental thickness by ultrasonography at the level of umbilical cord insertion as a parameter for determining the gestational age of fetus.

Inclusion criteria:

- Antenatal women of gestational age 20-40 weeks.
- Patients with known dates of last menstrual period.
- Singleton pregnancies with no fetal or congenital anomalies.
- No medical or obstetrical complications.
- H/o regular menstruation.

Exclusion criteria:

- Patients with P.I.H., Diabetes Mellitus, Intrauterine growth restriction, hydrops fetalis, congenital malformation, twins, polyhydramnios.
- Placental morphological variations
- Poor sonographic visualization of placenta due maternal obesity and other causes
- Oligo hydramnios
- Variation in umbilical cord insertion – battledore placenta, velamentous cord insertion.

Scanner and Transducers used:

Machine used for study is Aloka real time 2D ultrasound unit with a 3.5 MHZ convex transducer

The transducer is adjusted to scan perpendicular to both chorionic and basal plate.

The tangential scan[37] will give spurious measurement of thickness.

CORD INSERTION

- To obtain correct measurement the identification of cord insertion site is important. The site is usually central, but slight eccentric position is normal.

- In Ultrasonography the cord insertion appears as hypoechoeic areas closest to the Chorionic plate in the thickest portion of placenta.

(or)

- It appears as linear echoes at right angles from the placental surface.

- Placental thickness calculated from chorionic plate to placental myometrial interface.

- The myometrium & sub placental veins are not included in measurement.

- Placental measurements are taken during relaxed phase of uterus.

- Placental thickness depends on the amount of fetal blood, maternal blood and placental tissue.

Placental Myometrial Interface

Correct identification of Placental myometrial interface is important for measurements of placenta.

Placental thickness in millimeter, was calculated by taking the average of three measurements for each case.

Calculation of gestational age

- The gestational age is calculated from LMP.
- GA is also determined by composite fetal parameters by USG (BPD, HC, AC, FL), based on Hadlock table by using regression equation in software package
- The placental thickness in mm is measured at the level of insertion of umbilical cord.
- The sonographer must maintain a perpendicular distance between the placenta and uterine wall. Placental thickness is correlated with GA by LMP and FETAL BIOMETRY.

Statistical Analysis:

Descriptive statistics is done for all data and suitable statistical test of comparison were done. Continuous variables analyzed with the student t' test and categorical variables were analyzed with the chi square test and fisher exact test.

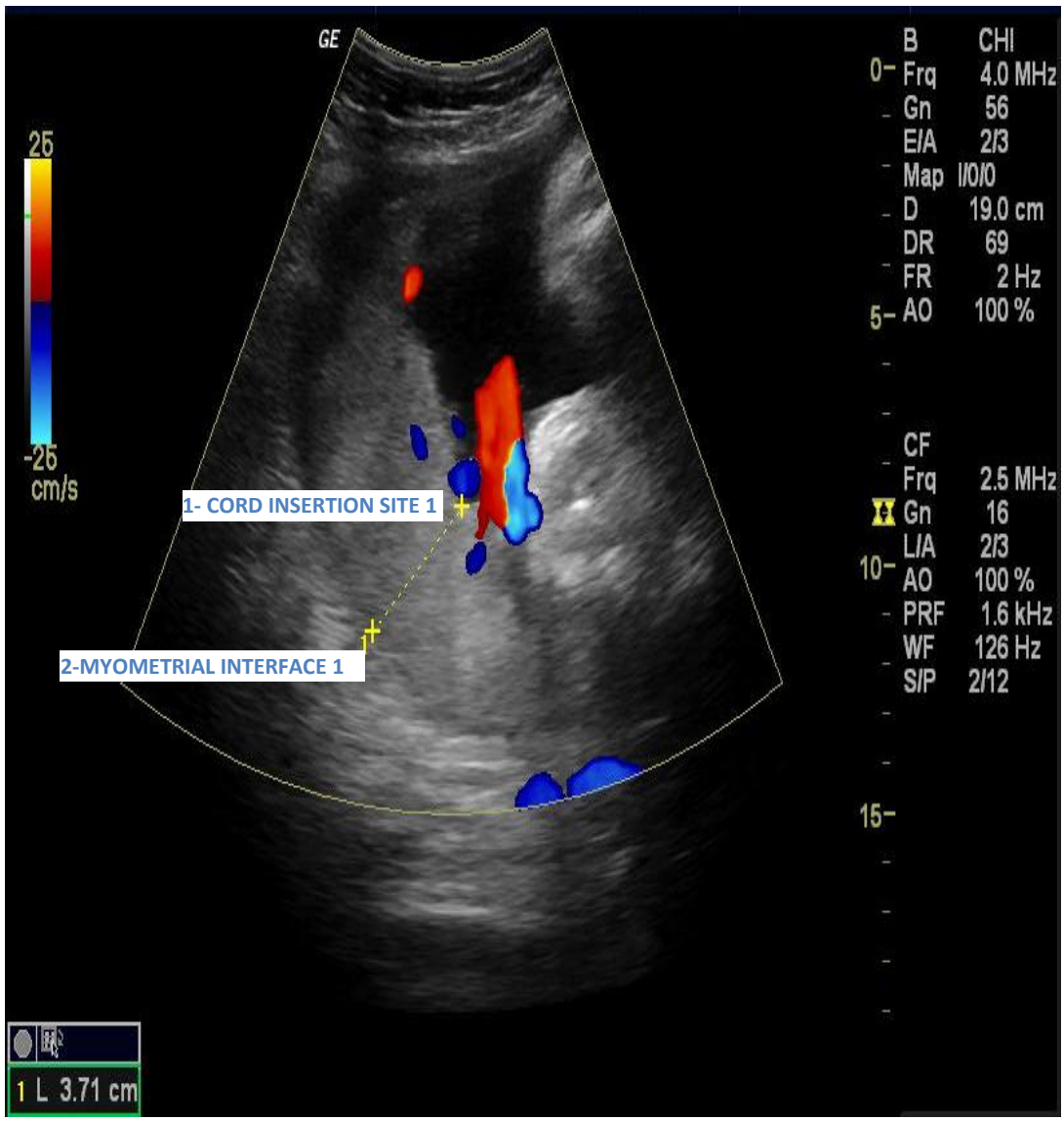
Statistical significance was taken as $P < 0.05$

Soft ware

The data was analyzed using EPIINFO software (7.1.0.6. version, centre for disease control, USA.) and Microsoft Excel 2010

REPRESENTATIVE PICTURES

PICTURE – 1



PLACENTAL THICKNESS MEASUREMENT

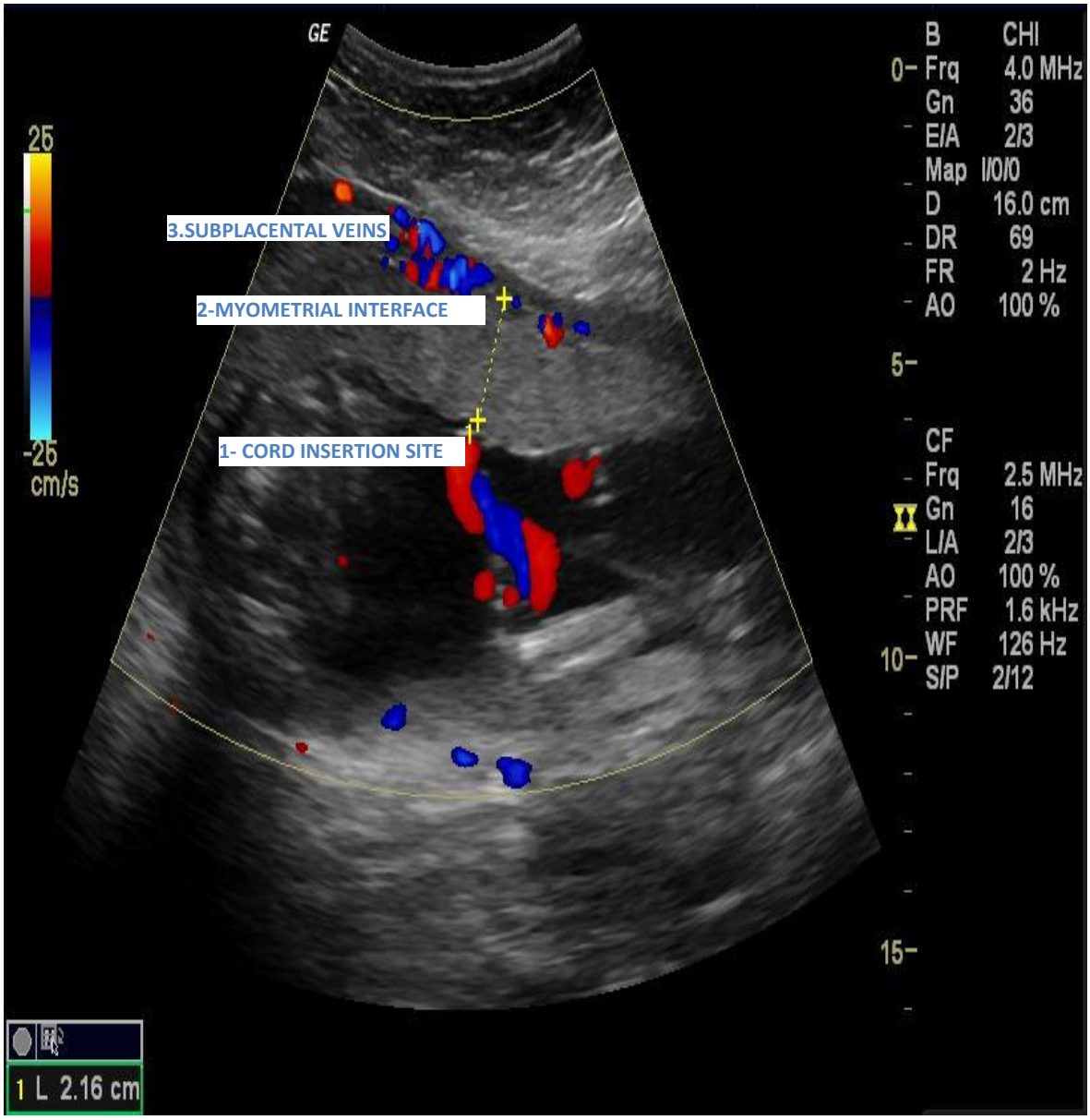
1 - Umbilical cord insertion in chorionic plate.

2 - Placental myometrial interface

The perpendicular distance is taken from umbilical cord insertion site at chorionic plate to placental myometrial interface excluding the myometrium and subplacental veins.

The measurement is taken as an average of 3 readings. The distance is about 37mm in above picture.

PICTURE - 2


GE
3.SUBPLACENTAL VEINS
2-MYOMETRIAL INTERFACE
1- CORD INSERTION SITE
25
-25
cm/s
B CHI
Frq 4.0 MHz
Gn 36
E/A 2/3
Map I/0/0
D 16.0 cm
DR 69
FR 2 Hz
AO 100 %
CF
Frq 2.5 MHz
Gn 16
L/A 2/3
AO 100 %
PRF 1.6 kHz
WF 126 Hz
S/P 2/12
1 L 2.16 cm

PLACENTAL THICKNESS MEASUREMENT

1 - Umbilical cord insertion in chorionic plate.

2 – Placental myometrial interface

3 subplacental veins

The perpendicular distance is taken from umbilical cord insertion site from chorionic plate to placental myometrial interface excluding the myometrium and subplacental veins.

The measurement is taken as an average of 3 readings. The distance is about 21mm. (2.1cm) Placenta - Anterior

The measurements are taken during relaxed phase of uterus.

A perpendicular distance is maintained between the placenta and uterine wall.

Tangential scan gives spurious measurement.

LABOR OUTCOME

Labor outcome are observed by gestational age at birth (term, Pre term, Post term) and birth weight.

GESTATIONAL AGE CLASSIFICATION OF NEW BORN

1. Assessment based on obstetric information GA estimates by first trimester ultrasonography are accurate within 4 days.

2. To confirm or supplement obstetric dating, the modified (Dubowitz) Ballard examination by newborn may be useful in GA estimation. There are limitations to this method, especially with the use of Neuro muscular component in sick newborns.

3. Infant classification by gestational age

    a) Preterm 'Less than 37 completed weeks (259 days)

    b) Late preterm – A subgroup of infants born at 34 through 36 weeks GA (238 – 258) days.

    c) Term – 37 to 41 6/7 weeks (260 – 294) days

    d) Post term – 42 weeks or more (295 days or more)

ESTIMATION OFGESTATIONAL AGE OF NEWBORN WITHIN FEW HOURS AT BIRTH

(< 37 Weeks) – Pre term

1. Deep sole creases are absent (or) limited to anterior 1/3 of sole
2. Genitalia – Testis at the external ring
3. Scrotum – small with few rugosities
4. Labia – In female infant are widely separated
5. Breast nodule - < 5mm in diameter
6. Ear cartilage – Is deficient & has poor elastic recoil
7. Hair – Fuzzy or woolly
8. Tone – Tone of muscle is reduced

Both legs return to flexed position in full term infant similarly extended arm recoil to flexed posture at elbow on release of arm. In preterm infant recoil of extremities is diminished.

RESULTS AND OBSERVATION

RESULT AND OBSERVATION

In our study 200 uncomplicated antenatal cases from 20 weeks to 40 weeks of gestation were included along with others fetal biometry placental thickness was measured and the labor outcome of those women was followed.

The results were analysed with respect to maternal age, parity, placental thickness, birth weight and gestational age at birth.

The mean values of placental thickness & its standard deviation were calculated for gestational age from 20 – 40 week.

Using pearson's, correlation between gestational age and Placental thickness analysed.

TABLE - 1

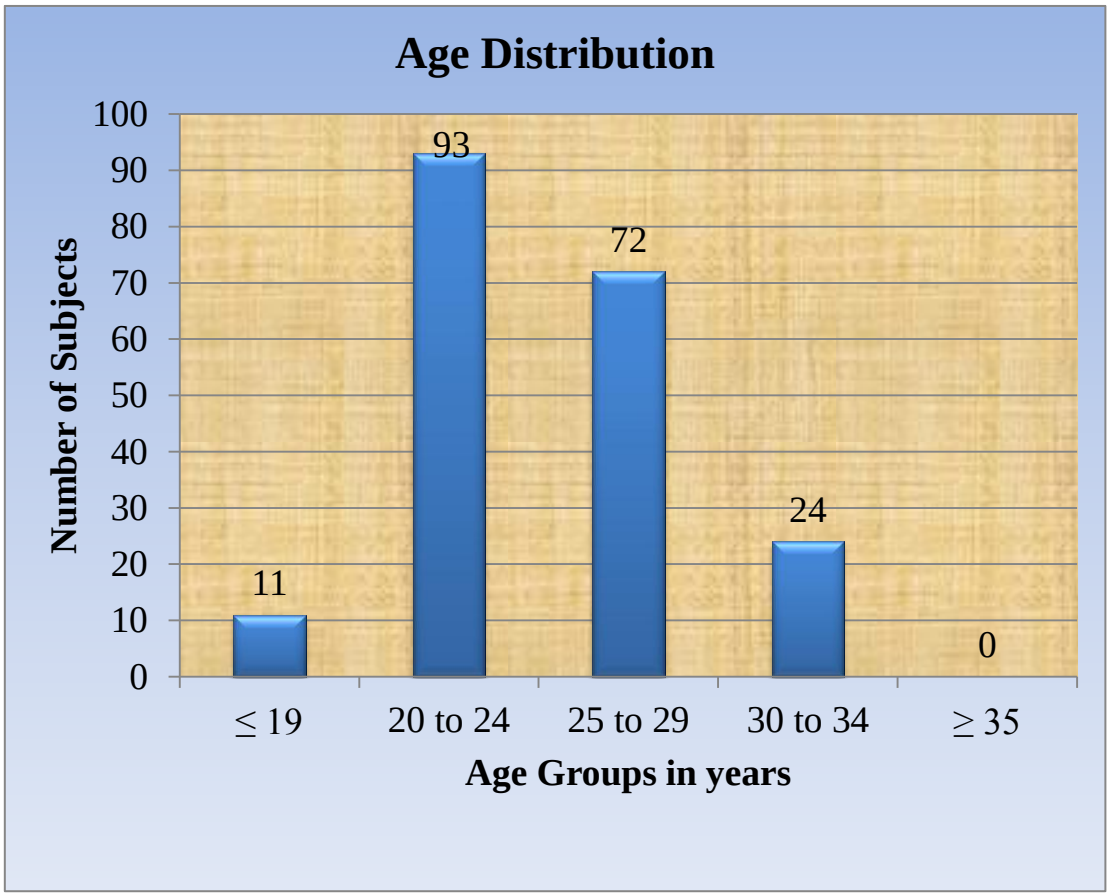
AGE DISTRIBUTION

In the total study of 200 normal antenatal women, age ranged from 19years – 34years. The mean age was 24.7years.

Age in Years	All	%
≤ 19	11	5.50
20 to 24	93	46.50
25 to 29	72	36.00
30 to 34	24	12.00
≥ 35	0	0.00
Total	200	100

Age Distribution	
N	200
Mean	24.71
SD	3.659626

AGE DISTRIBUTION



Most of the women were in the age group of 20-24 years.

TABLE - 2

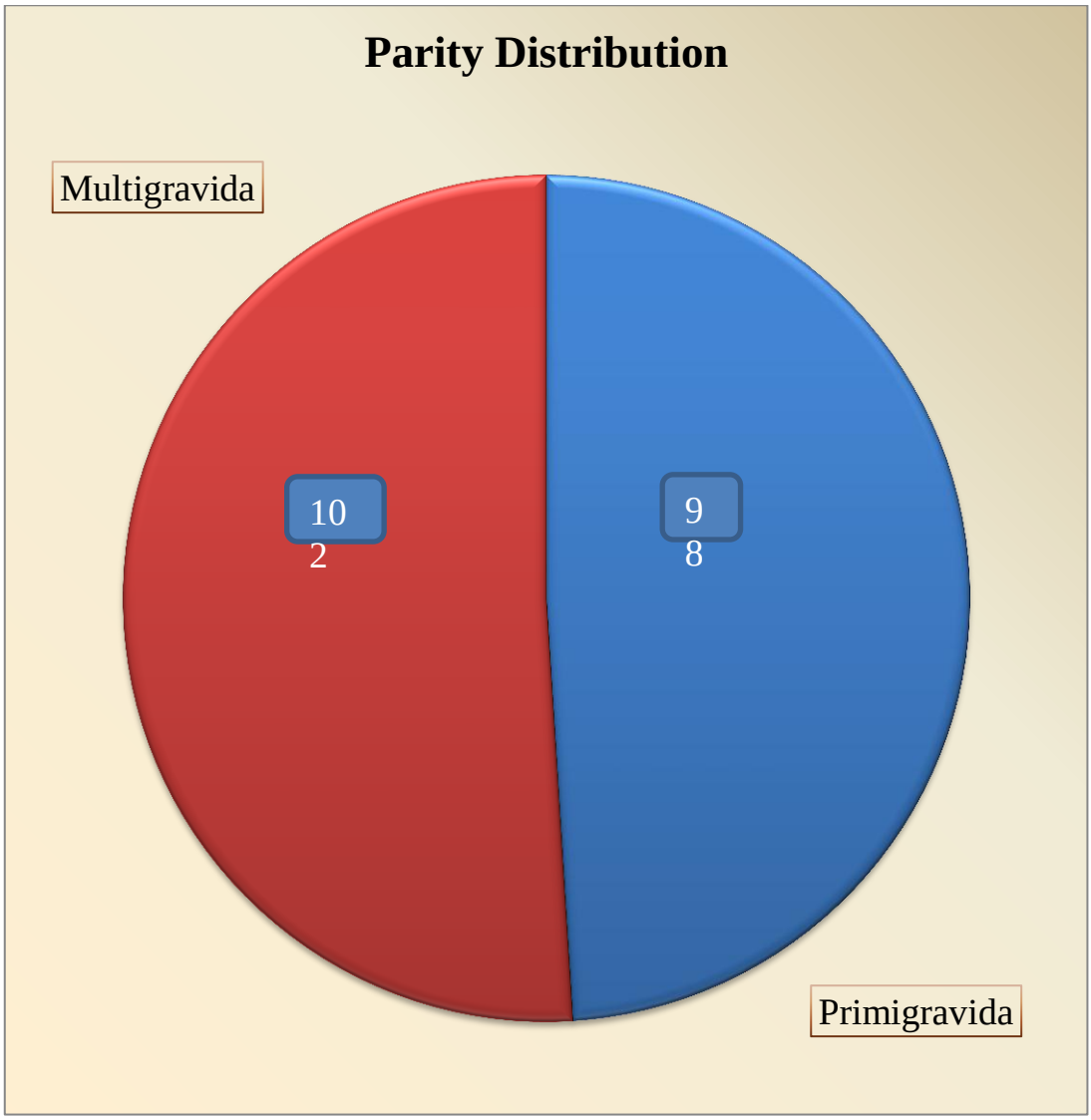
PARITY

Parity	All	%
Primigravida	98	49.00
Multigravida	102	51.00
Total	200	100

Out of 200 cases, 98 cases of primigravida

102 cases of multigravida

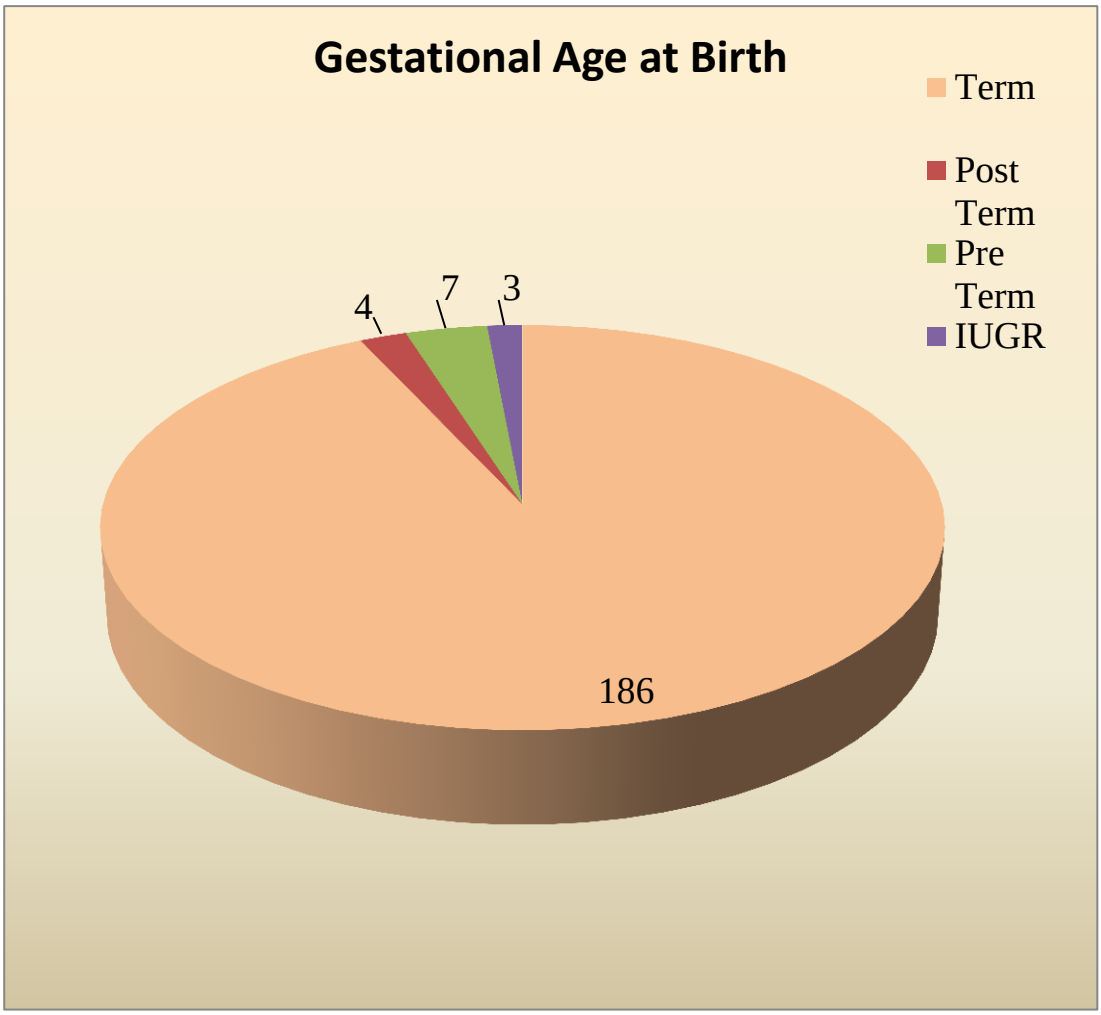
PARITY



Multiparity is more common.

LABOR OUTCOME

GESTATIONAL AGE AT BIRTH



Most common are term babies.

TABLE - 3

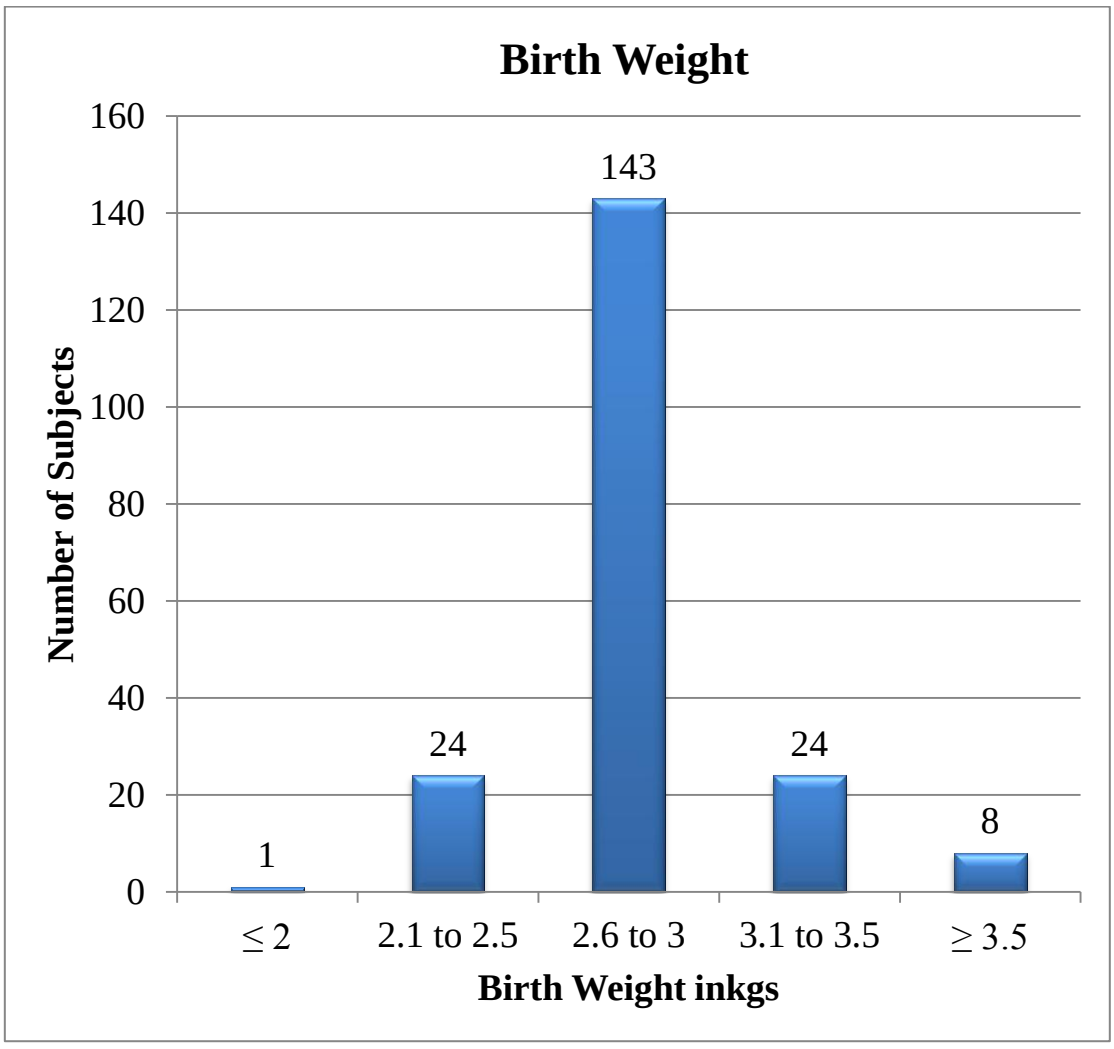
Gestational Age at Birth	N	%
Term	186	93
Post term	4	3.5
Pre term	7	2
IUGR	3	1.5
Total	200	100

Most common gestational age at birth are term babies. It constitute about 93%.

LABOR OUTCOME

TABLE - 4

BIRTH WEIGHT



Most of the babies weighed between 2.6-3 kgs.

TABLE - 4

Birth Weight	All	%
≤ 2	1	0.50
2.1 to 2.5	24	12.00
2.6 to 3	143	71.50
3.1 to 3.5	24	12.00
≥ 3.5	8	4.00
Total	200	100

Most of the babies weighed about 2.6-3kgs.

TABLE - 5

DISTRIBUTION OF PLACENTAL POSITION

Placental Location	N	%
Anterior	87	43.5
Posterior	66	33
Lateral	24	12
Fundal	20	10
Low Lying	3	1.5
Total	200	100

Out of 200 cases studies anterior placenta was noted in 87, posterior 66, fundal 20, Lateral 24, Low lying 3.

DISTRIBUTION OF PLACENTAL POSITION

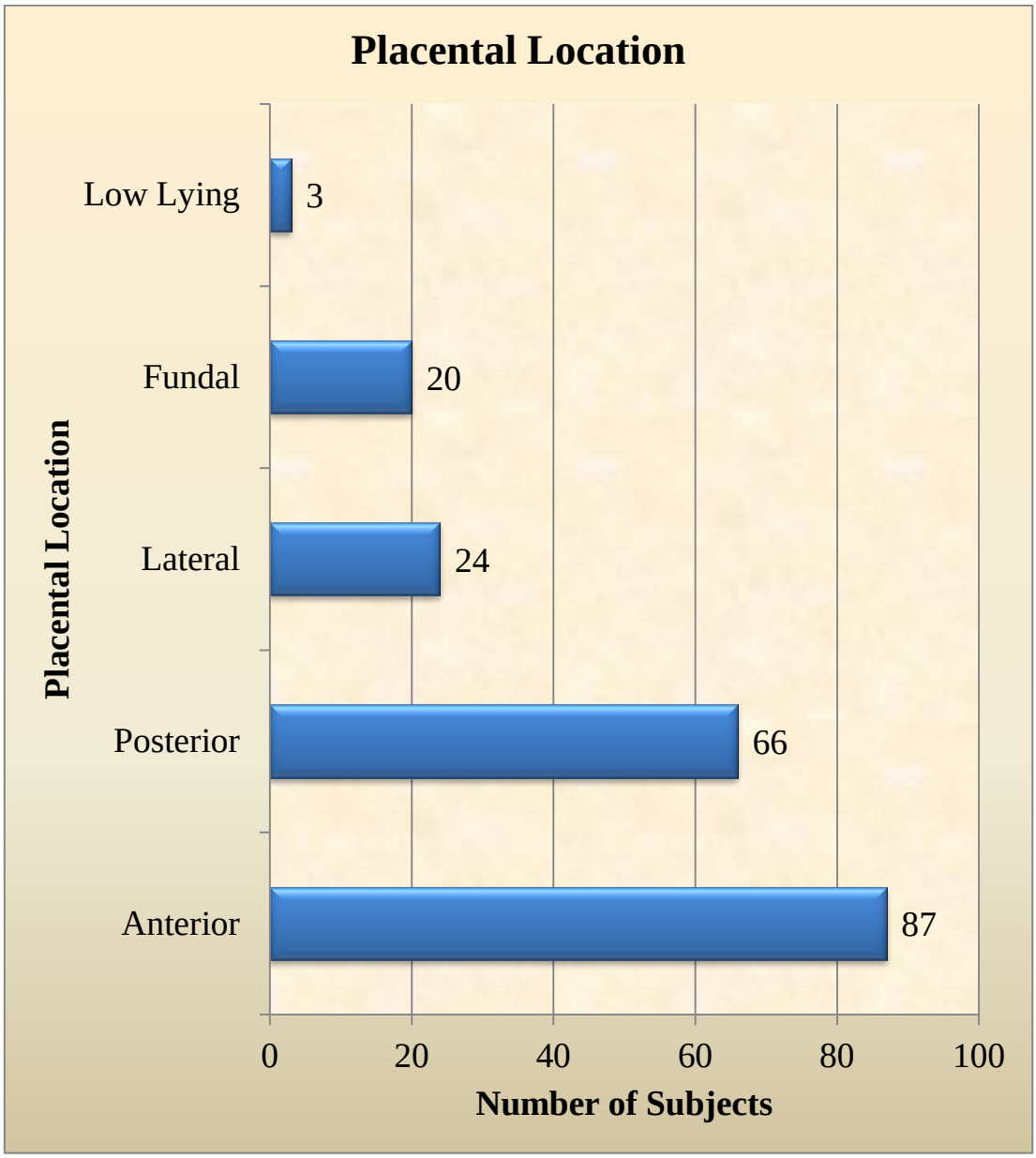


TABLE - 6

THE NUMBER OF MEASUREMENTS FOR EACH WEEK OF GESTATIONAL AGE

GA	N	%
20	17	8.5
21	39	19.5
22	13	6.5
23	6	3
24	10	5
25	2	1
26	13	6.5
27	4	2
28	8	4
29	5	2.5
30	7	3.5
31	5	2.5
32	8	4
33	11	5.5
34	7	3.5
35	14	7
36	7	3.5
37	16	8
38	2	1
39	6	3
40	2	1
Total	200	100

The number of measurements ranged from 2 – 39. A total of 200 measurements were obtained from 200 patients.

THE NUMBER OF MEASUREMENTS FOR EACH WEEK OF GESTATIONAL AGE

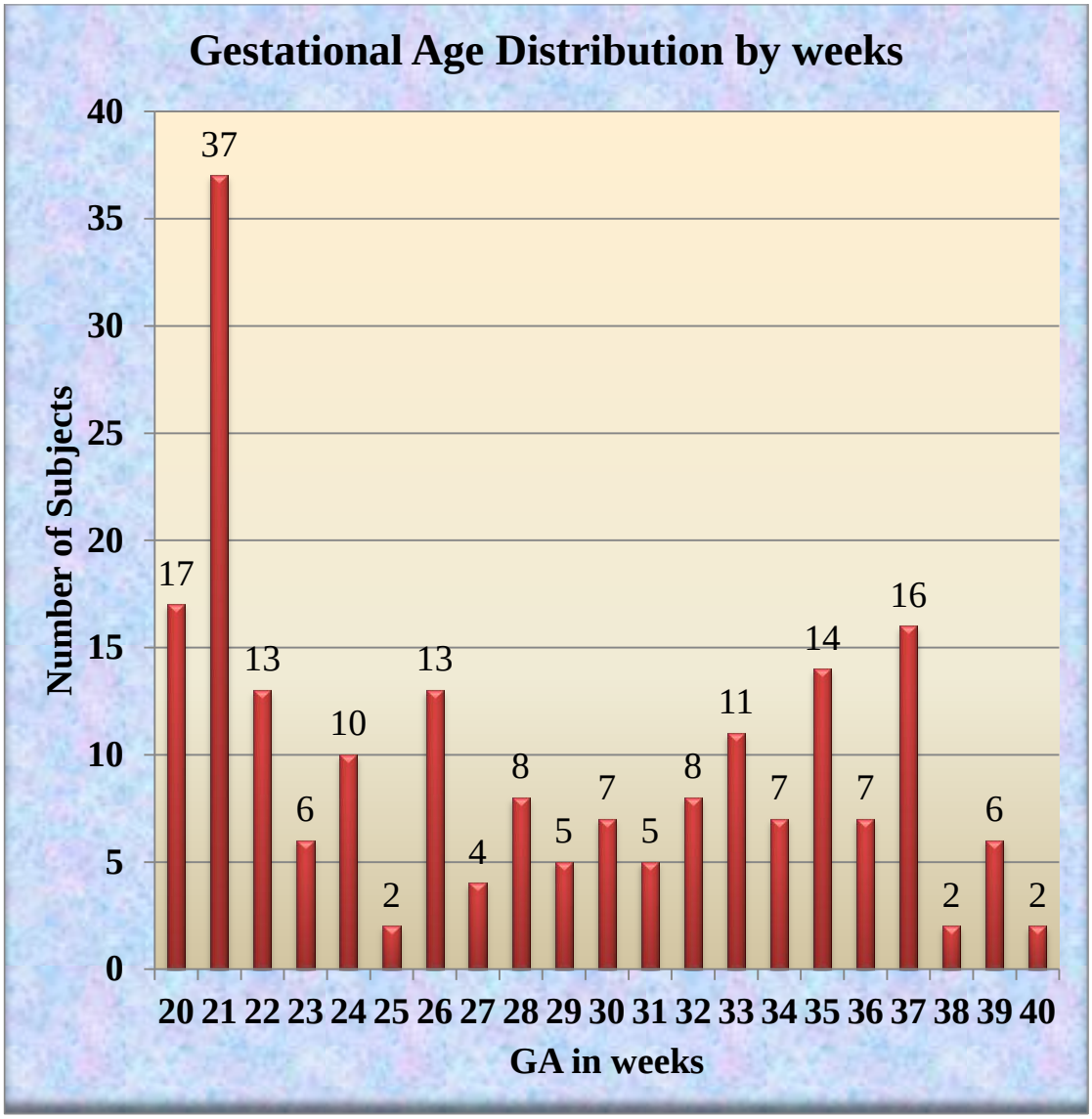


TABLE - 7

RELATIONSHIP BETWEEN GESTATIONAL AGE AND PLACENTAL THICKNESS

GA	N	PT-Mean	PT-SD	PT-GA
20	17	20.23	0.51	0.23
21	37	21.35	0.32	0.35
22	13	22.35	1.21	0.35
23	6	23.37	0.41	0.37
24	10	24.35	0.55	0.35
25	2	25.41	0.58	0.41
26	14	26.33	0.62	0.33
27	4	27.35	0.5	0.35
28	8	28.25	1.04	0.25
29	5	29.2	0.45	0.2
30	7	30.14	0.38	0.14
31	5	31.12	0	0.12
32	8	32.05	1.07	0.05
33	11	33.03	0.47	0.03
34	7	34.02	0.49	0.02
35	15	34.81	0.52	-0.19
36	7	35.38	0.69	-0.62
37	16	36.1	0.77	-0.9
38	2	37.07	0.71	-0.93
39	6	38.01	0.75	-0.99
40	2	38.54	0.79	-1.46

It is observed that placental thickness gradually increased from 20.23mm from 20 weeks to 34mm at 35 weeks.

Gestational age in weeks	Number of Cases	PT - mean	PT - SD	Pearson's Correlation	P value
≤ 36	179	28.331	5.66	0.99200459	0.00
37 to 38	13	36.585	0	0.20358285	0.00
39 to 40	8	38.275	0.46	0.09406101	0.00

By conventional criteria, the association between the placental thickness and gestational age measured using ultrasound is considered to be statistically significant since $p < 0.05$.

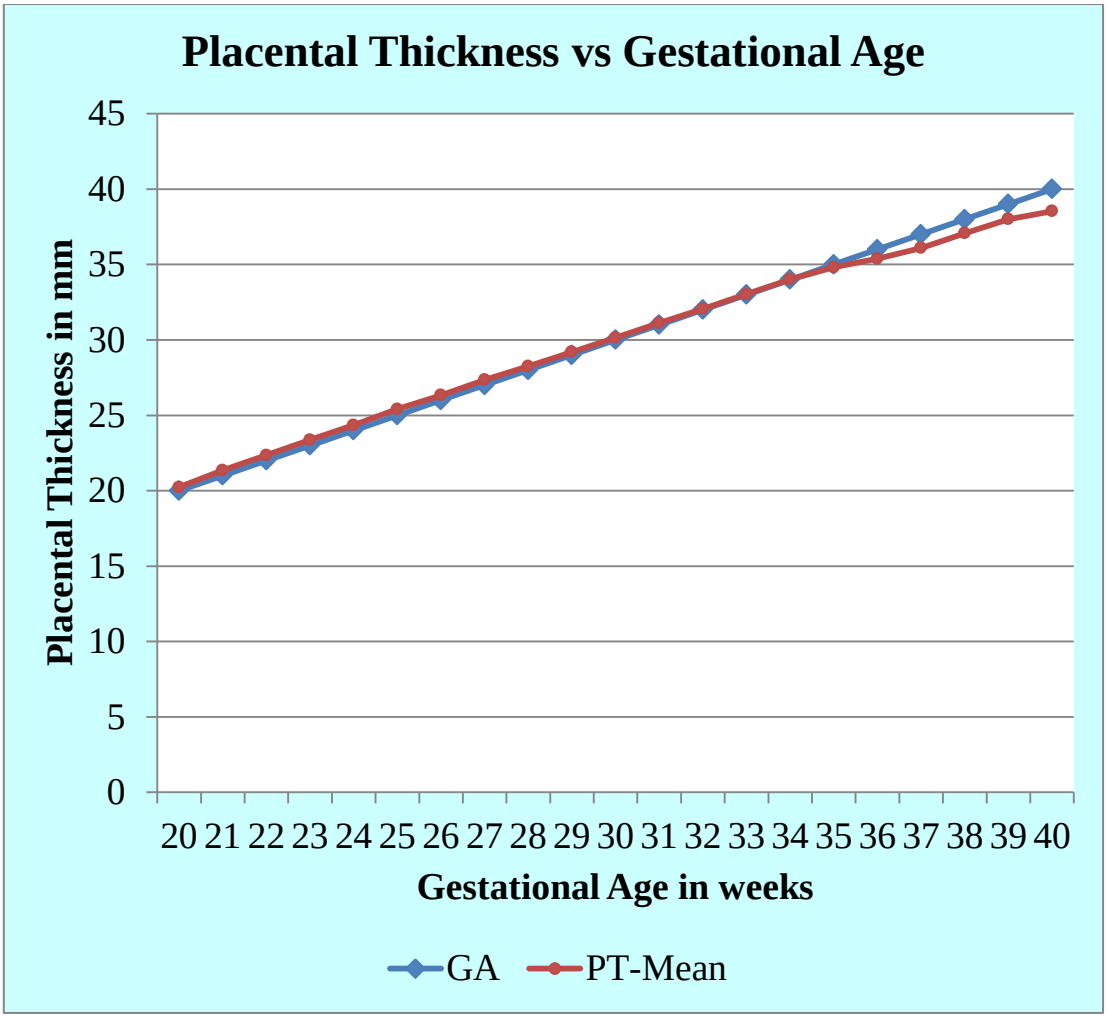
Statistical Significance

This indicates that there is a true difference among groups and the difference is significant. In simple terms, while evaluating the Placental thickness as a Ultrasonographic parameter for estimation of the Gestational age of the fetus, a highly positive correlation between mean placental thickness measurements and gestational age(between 20 to 35 weeks) measured using ultrasound was observed with a **pearson's coefficient of 0.99200459.**

It was statistically significant with a p-value of 0.000 according to unpaired t test.

GRAPH - 1

RELATIONSHIP BETWEEN GESTATIONAL AGE AND PLACENTAL THICKNESS

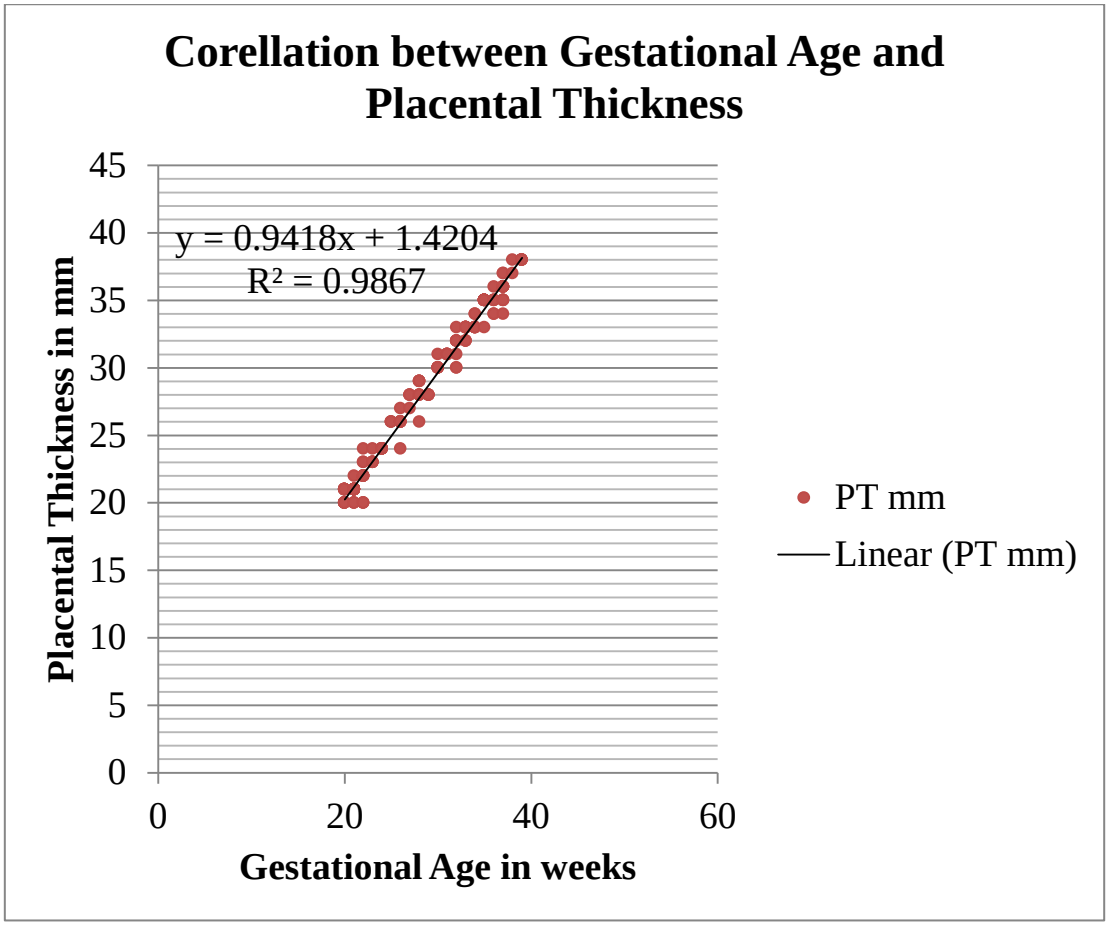


From 20 weeks to 35 weeks of gestation the placental thickness almost matched the gestational age in weeks in a linear fashion.

The placental thickness did not correlate from 36 weeks to 40 weeks.

GRAPH - 2

CORELLATION BETWEEN GESTATIONAL AGE AND PLACENTAL THICKNESS



Placental thickness in millimeter Increase with gestational age in weeks from 20 to 35 weeks. The Rate of growth being 1cm per week.

This graph shows a linear correlation between placental thickness and gestational age in weeks.

TABLE - 8

PLACENTAL THICKNESS VS PARITY

Placental Thickness	Primigravidae	%	Multigravidae	%
21 to 25 mm	51	52.04	36	35.29
26 to 30 mm	15	15.31	22	21.57
31 to 35 mm	24	24.49	32	31.37
36 to 40 mm	8	8.16	12	11.76
Total	98	100	102	100

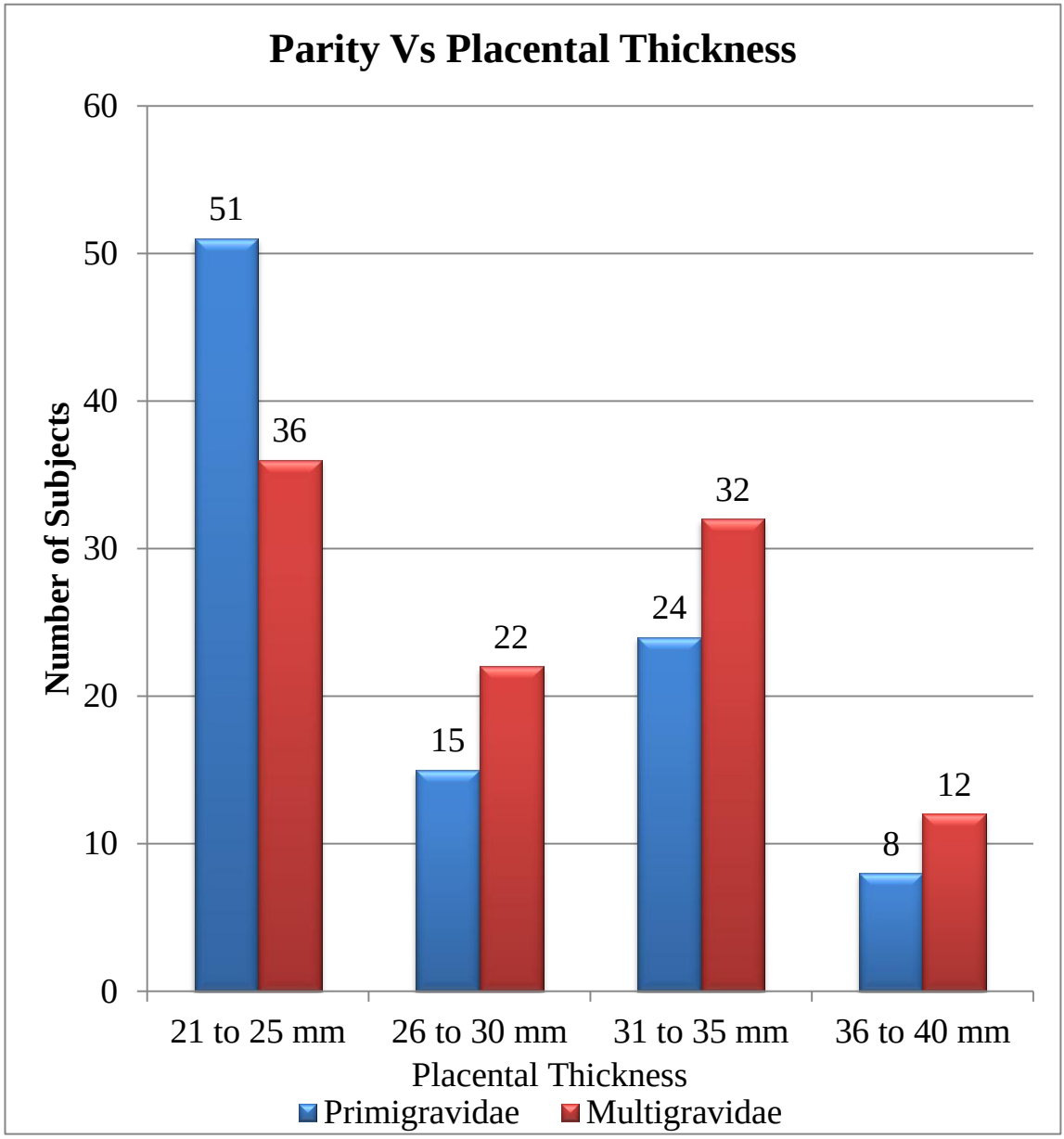
Placental Thickness	Primigravidae	Multigravidae
N	98	102
Mean	26.52	28.59
SD	5.70	6.18
P value Unpaired t-test	0.1775	

P Value by unpaired ‘t’ test 0.1775

By conventional criteria the association between the placental thickness and parity is considered to be statistically not significant since p > 0.05.

There is no definite correlation b/w parity and placental thickness. Test of significant is calculated by unpaired ‘t’ test

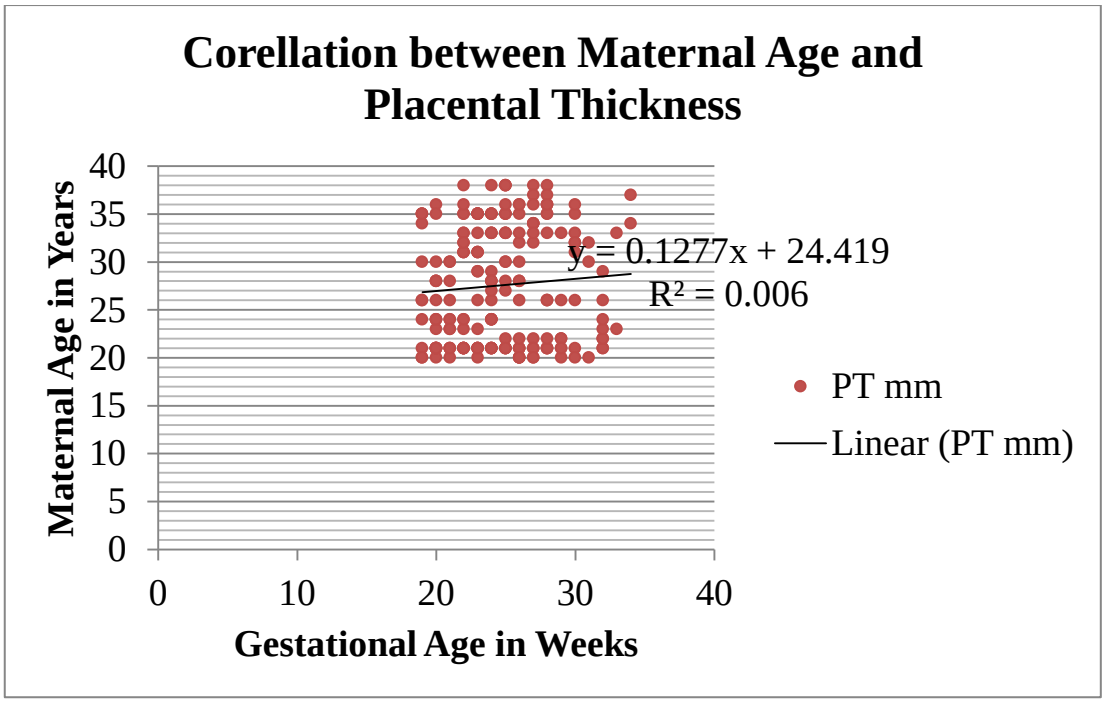
There is no significant correlation between parity and placental thickness.



There is no significant correlation between parity and placental thickness.

GRAPH - 3

MATERNAL AGE AND PLACENTAL THICKNESS



There is no correlation between maternal age and placental thickness as there is dispersion of variables.

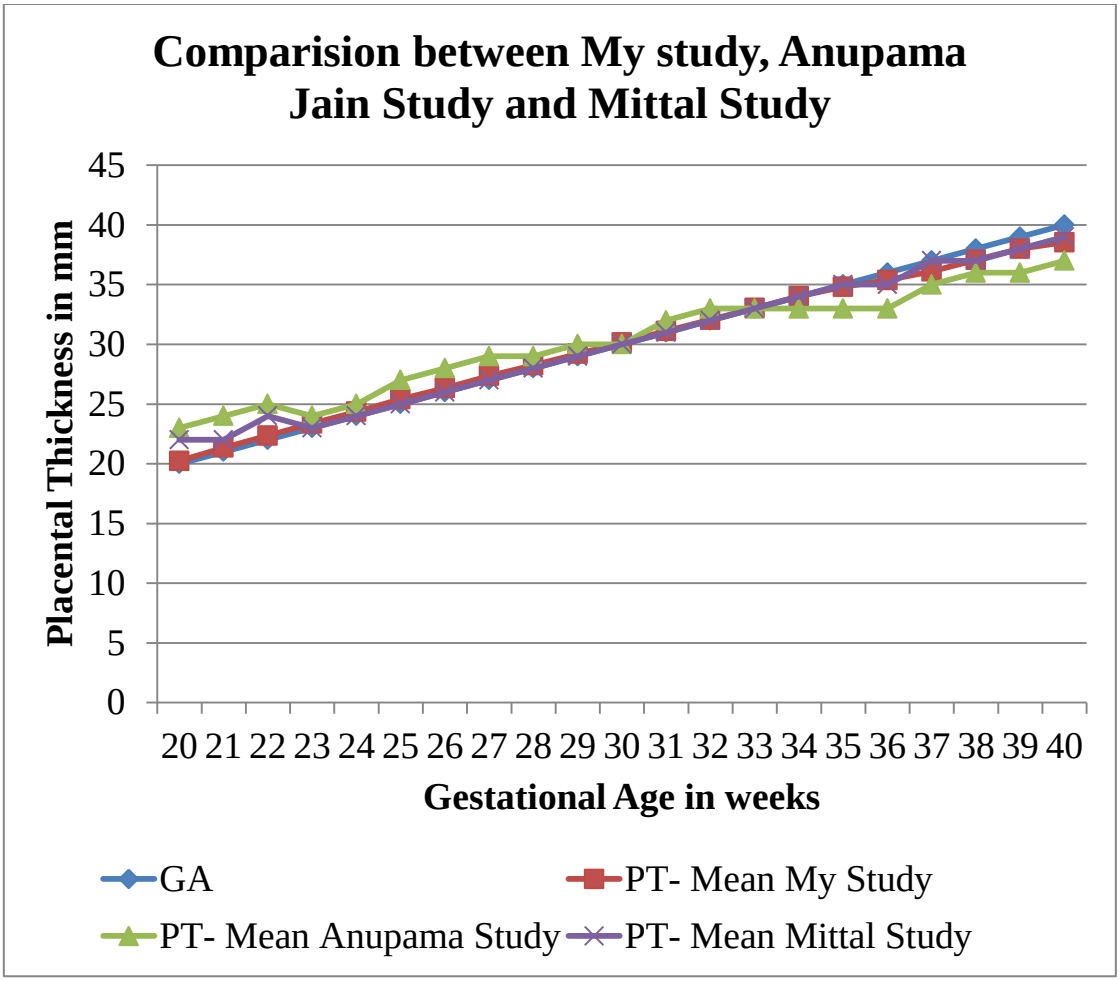
TABLE – 9

COMPARISION STUDIES

GA	PT- Mean My Study	PT- Mean Anupama Study	PT- Mean Mittal Study
20	20.23	23	22
21	21.35	24	22
22	22.35	25	24
23	23.37	24	23
24	24.35	25	24
25	25.41	27	25
26	26.33	28	26
27	27.35	29	27
28	28.25	29	28
29	29.2	30	29
30	30.14	30	30
31	31.12	32	31
32	32.05	33	32
33	33.03	33	33
34	34.02	33	34
35	34.81	33	35
36	35.38	33	35
37	36.1	35	37
38	37.07	36	37
39	38.01	36	38
40	38.54	37	39

GRAPH - 4

COMPARISON OF STUDIES



Placental thickness shows a linear increase with gestational age in weeks.

In Mittal study from 22nd week to 35th week of gestation the placental thickness coincide exactly with the gestational age in weeks.

In Anupam Jain study placental thickness almost matched equally from 27th week to 33 week of gestation.

Variable	Test of Significance	P Value
GA by LMP & PT	Pearson's correlation	0.000 (Significant)
Parity & PT	Unpaired 't' test	0.1775(Not Significant)
Maternal age & PT	Correlation of graph shows	dispersion of variables (Not Significant)

REFRESENTATIVE CASES

Case – 1

Age: 28 GA (LMP)-37 weeks

Menstural H/O ; Regular

Obstetric Code: $G_2P_1L_1$

Medical disorder; Nil

Clinical Examination:

Uterine height corresponds to term

Head unengaged

FHR – 140 / mt

USG findings

No of fetus: Single

Presentation: Cephalic

Biometry:

BPD – 95mm

HC - 355mm

AC – 363mm

FL – 69 mm

Average gestation - 37 weeks

Placental location: Posterior

Placental thickness: 37mm

AFI – 14

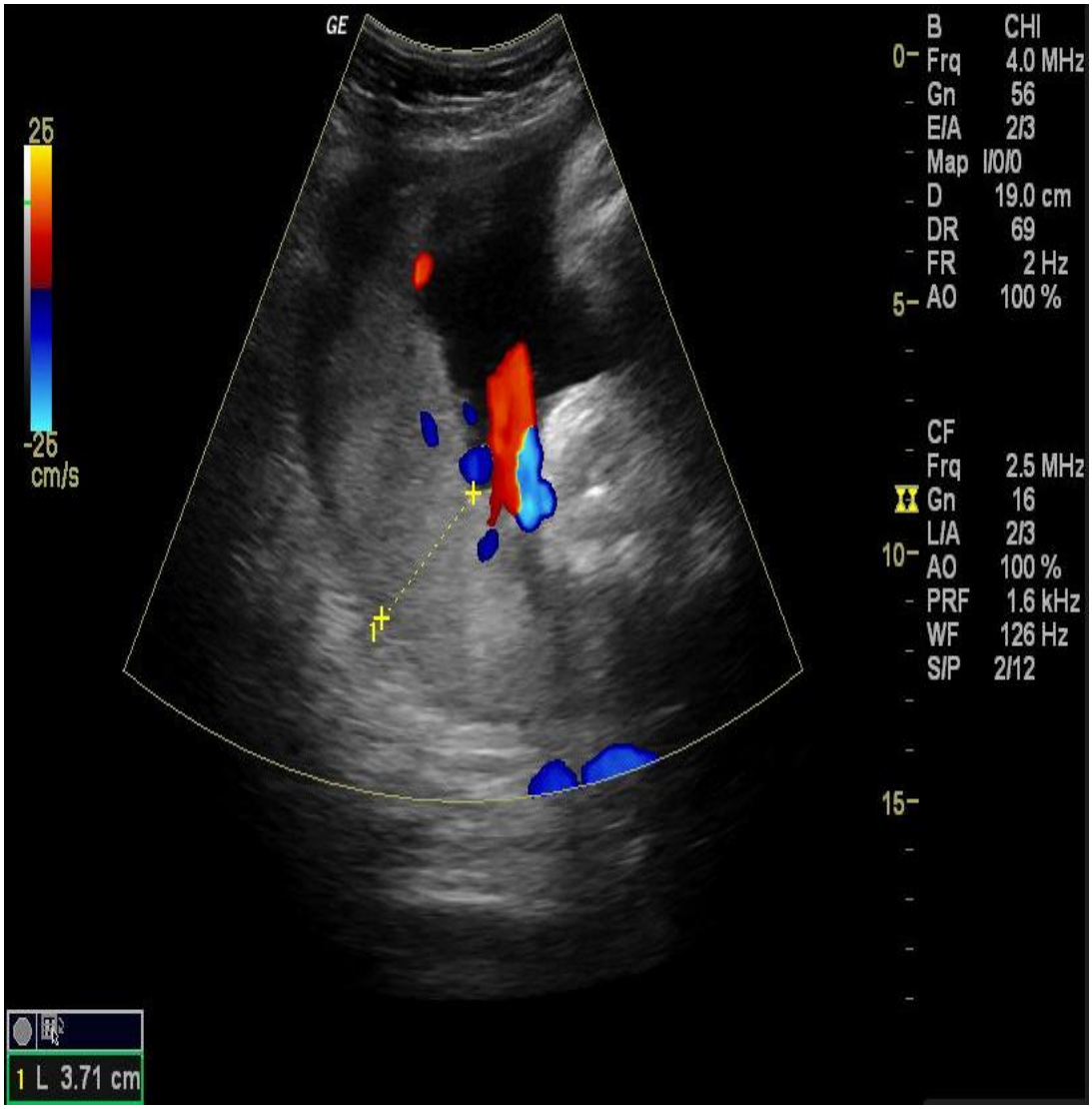
Impression:

Single live fetus 37 weeks of gestation

Postnatal details: (Labor Outcome)

Gestational age at birth: Term

Birth weight: 2.7 kg


GE
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-25
cm/s
B CHI
Frq 4.0 MHz
Gn 56
E/A 2/3
Map I/0/0
D 19.0 cm
DR 69
FR 2 Hz
AO 100 %
CF
Frq 2.5 MHz
Gn 16
L/A 2/3
AO 100 %
PRF 1.6 kHz
WF 126 Hz
S/P 2/12
1 L 3.71 cm

Case – 2

Age: 27 GA(LMP)-37 weeks

Menstural H/O ; Regular

Obstetric Code: $G_2P_1L_1$

Medical disorder; Nil

Clinical Examination:

Uterine height corresponds to term

Head unengaged

FHR – 142 / mt

USG findings

No of fetus: Single

Presentation: Cephalic

BPD – 87mm

HC - 328mm

AC – 313mm

FL – 70 mm

Average gestation - 37 weeks

Placental location: Lateral

Placental thickness: 37mm

AFI – 9

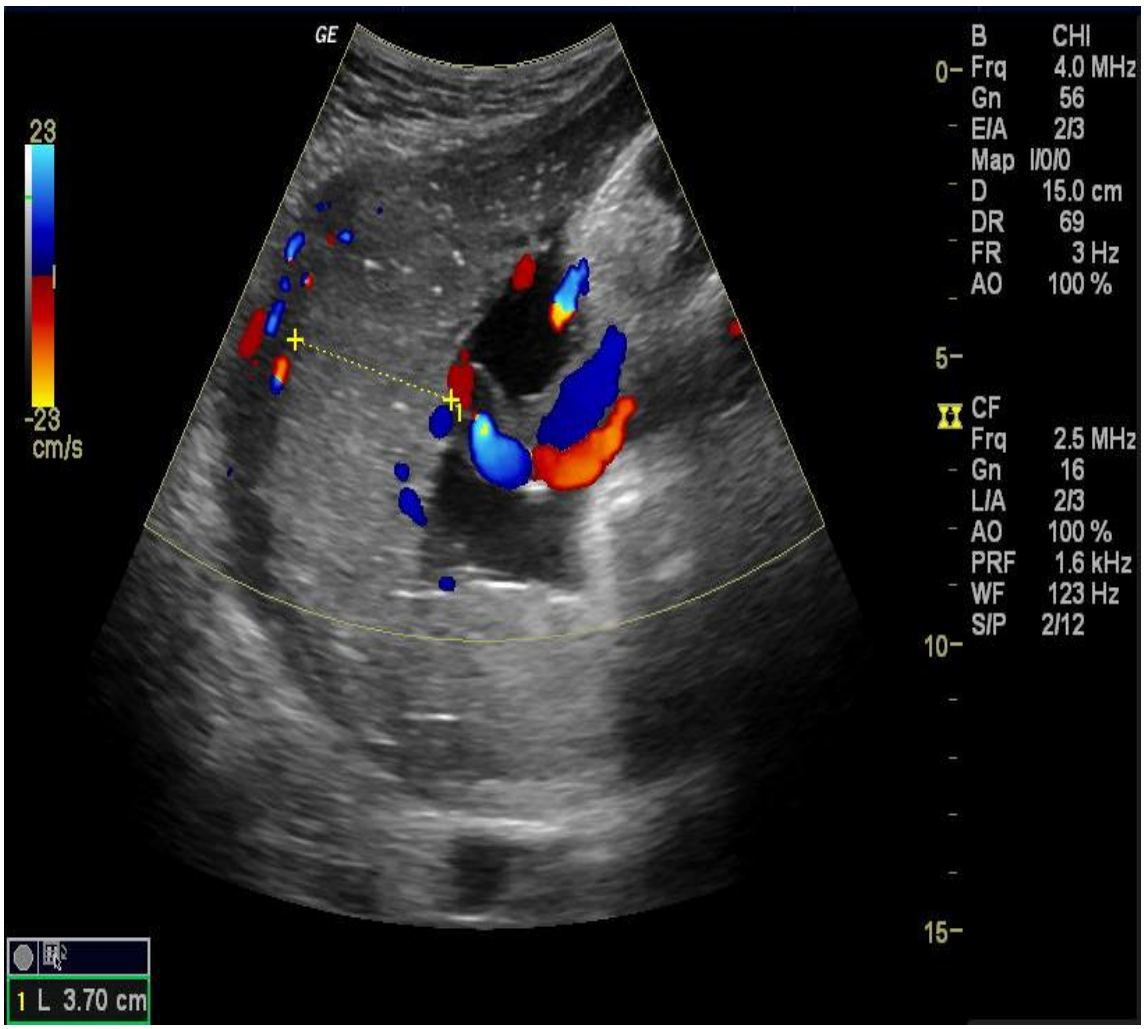
Impression:

Single live fetus 37 weeks of gestation

Postnatal details: (Labor Outcome)

Gestational age at birth: Term

Birth weight: 2.8 kg


GE
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E/A 2/3
Map I/0/0
D 15.0 cm
DR 69
FR 3 Hz
AO 100 %
CF
Frq 2.5 MHz
Gn 16
L/A 2/3
AO 100 %
PRF 1.6 kHz
WF 123 Hz
S/P 2/12
0
5
10
15
1 L 3.70 cm

Case – 3

Age: 30 GA(LMP)-21 weeks

Menstural H/O ; Regular

Obstetric Code: $G_2P_1L_1$

Medical disorder; Nil

Clinical Examination:

Uterine height corresponds to 20 weeks

Fetal parts felt

FHR – 158 / mt

USG findings

No of fetus: Single

Presentation: Cephalic

BPD – 49mm

HC - 180mm

AC – 159mm

FL – 34 mm

Average gestation - 21 weeks

Placental location: Anterior

Average Placental thickness: 21.6 mm

Liquor Adequate

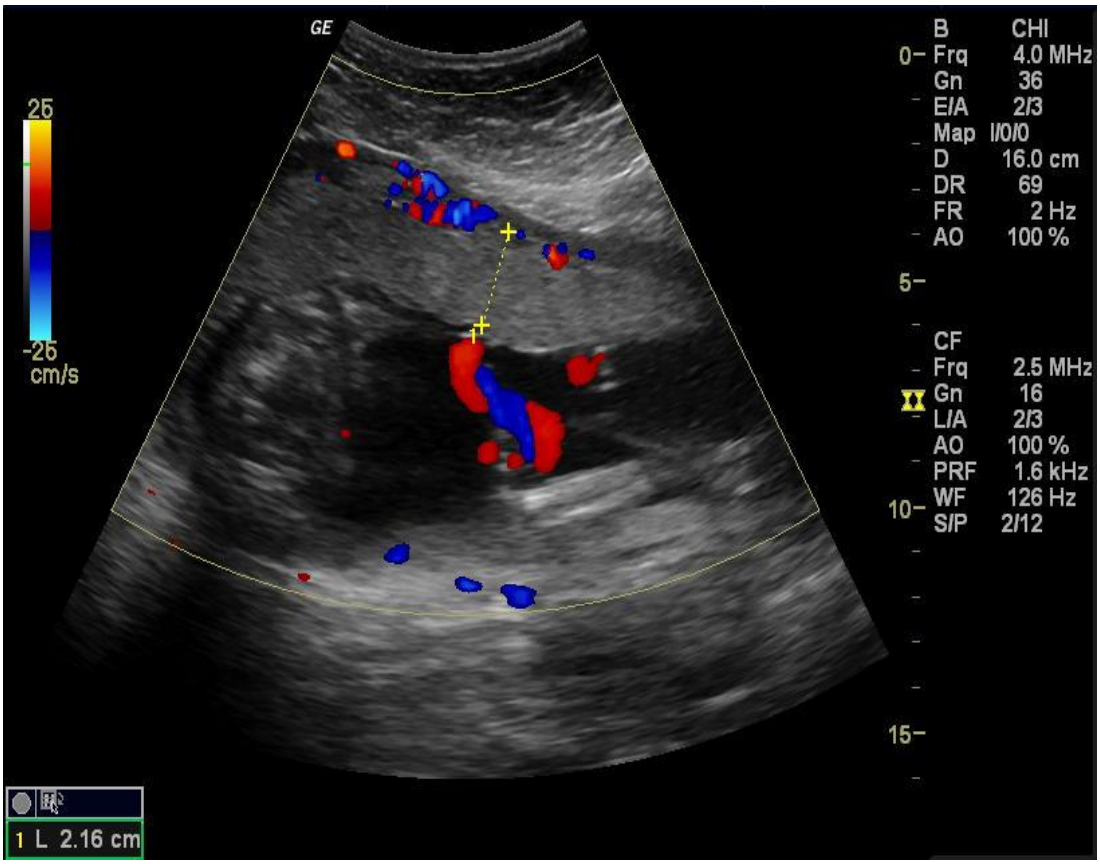
Impression:

Single live fetus 21 weeks of gestation

Postnatal details: (Labor outcome)

Gestational age at birth: Term

Birth weight: 2.8 kg


GE
25
-25
cm/s
B CHI
Frq 4.0 MHz
Gn 36
E/A 2/3
Map I/0/0
D 16.0 cm
DR 69
FR 2 Hz
AO 100 %
CF
Frq 2.5 MHz
Gn 16
L/A 2/3
AO 100 %
PRF 1.6 kHz
WF 126 Hz
S/P 2/12
1 L 2.16 cm

Case – 4

Age: 27 GA(LMP)-35 weeks

Menstural H/O ; Regular

Obstetric Code: $G_2P_1L_1$

Medical disorder; Nil

Clinical Examination:

Uterine height corresponds to 34-36 weeks

Head mobile

FHR – 142 / mt

USG findings

No of fetus: Single

Presentation: Cephalic

BPD – 86mm

HC - 317mm

AC – 324mm

FL – 72 mm

Average gestation - 35 weeks

Placental location: Posterior

Average Placental thickness: 35 mm

AFI - 14

Impression:

Single live fetus 35 weeks of gestation

Postnatal details: (Labor outcome)

Gestational age at birth: Term

Birth weight: 2.6 kg


15.0cm 15Hz
Pwr 180
Gn 5.4
Frq mid
1 D 3.56cm

Case – 5

Age: 24 GA(LMP)-33 weeks

Menstural H/O ; Regular

Obstetric Code: Prini

Medical disorder; Nil

Clinical Examination:

Uterine height corresponds to 32-34 weeks

Head mobile

FHR – 144 / mt

USG findings

No of fetus: Single

Presentation: Cephalic

BPD – 81mm

HC - 293mm

AC – 267mm

FL – 65 mm

Average gestation - 32 weeks

Placental location: Anterior

Average Placental thickness: 33 mm

AFI - 16

Impression:

Single live fetus 33 weeks of gestation

Postnatal details: (Labor outcome)

Gestational age at birth: Term

Birth weight: 2.8 kg


11.7cm 13Hz TIs 0.5
19:37:26
2+3 TRIM
Pwr 100%
Gn 7
C7 M5
P4 / L2
Pwr 100%
Gn 5.4
Freq mid
PRF 1.8kHz

DISCUSSION

DISCUSSION

Obstetrician need an accurate knowledge of GA for efficient management in following period of pregnancy

1. In early pregnancy to schedule chorionic villous sampling (9-12 weeks) & Amniocentesis.

2. In term pregnancy – to anticipate spontaneous delivery or to plan elective delivery.

3. In evaluating fetal growth, because the range of size of any fetal parameter changes with the advancing age.

Up to 50% of mother who claim to know their obstetric dates with certainty or infact more than 2 weeks in error when GA is calculated with ultrasound. A discrepancy of 2 weeks can be critical for the survival of an infant who has to deliver early because of some antenatal complications.

The importance of an accurate determination of GA and EDD in the high risk patient cannot be over emphasized. The reliability of EDD may be rated as excellent, good and or poor using a set of clinical and ultrasound criteria.

Excellent dates:

1. Patients with adequate clinical information (Known, Normal LMP[44], 28 – 30 days cycles; no recent use of oral contraceptives; uterine size in agreement with dates) plus ultrasound examination between 16 and 24 weeks indicating that the fetal measurements are in agreement with the clinical estimation of gestational age.

2. Patients with inadequate or incomplete clinical information (as defined above) and one confirming ultrasound examination between 16 and 24 weeks showing linear fetal growth and similar EDD.

Good dates:

1. Patients with adequate clinical information (as defined above) and one confirming ultrasound examination obtained after 24 weeks of gestation.

2. Patients with inadequate or incomplete clinical information and two or more ultrasound examination showing adequate growth and similar EDD.

Poor dates:

Any clinical situation different from those listed above.

Clinical dating is not very accurate. In a patient with reliable clinical criteria, an USG is necessary for confirmation. In 3rd trimesters, fetal biometry (BPD, AC, & FL) are inaccurate in calculating GA hence, this study is conducted if placental thickness is accurate in establishing GA in 2nd & 3rd trimester

The biometric commonly used for determining gestational age are

1st trimester – CRL.

After 12 weeks. (BPD, HC, AC, FL)

Each measurement is averaged and the mean is the estimated gestational age of fetus.

Out of 242 cases, 42 cases did not come for delivery to our Hospital. Hence the study was conducted in 200 normal antenatal women. Age of women ranged from 19 – 34 years most of the women were in the age group of 20 – 24 years. They constitute about 46.50%.

Out of 200 cases, primigravida were 98, & multigravida constitute about 102 multigravida is common and they comprise about 51%.

The labor outcome was observed in terms of gestational age at birth (term/Preterm/Post term) and by birth weight.

Out of 200 cases, term babies – 186, (93%) Post term babies – 4(305%) and preterm babies – 7 (2%). IUGR – 3 (1.5%.

Most of the babies weight in the range of 2.6 – 3kg (71.5%).

Out of 200 cases placental location were in the range of Anterior – 87 (43.5%), Posterior – 66 (33%), Lateral – 24 (12%), Fundal – 20 (10%), Lowlying – 3 (1.5%).

Number of measurement for each week of gestational age is maximum at 21 week – (19.5%).

In our study we analyzed 200 uncomplicated antenatal cases from 20 weeks of gestation till 40 weeks. The fetal outcome was term babies in most of the cases cases. Placental thickness was measured at the level of cord insertion.

The mean values and standard deviation of placental thickness and GA between 20 to 40 weeks were calculated. It was observed that the placental thickness increased from 20.23mm at 20 weeks to 34.8mm at 35 weeks.

From 20 weeks to 35 weeks of gestation the placental thickness almost matched the gestational age in weeks. There after the placental thickness falls by 1 – 2cm.

The present study assessed the relationship between the gestational age in weeks and placental thickness in mm(millimeter) by ultrasound.

The value of mean placental thickness increased with gestational age almost matching from 20 – 35 weeks as shown in graph – 1.

Our study results are consistent with observations made by mittal et al 2002. Anupam Jain 2001 reported the placental thickness increased with advancing gestations and matched from 20 to 35 weeks as shown in Graph – 4

In our study there is statistically significant correlation between placental thickness and gestational age $P < 0.00$.

For every unit (week) increase in gestational age the placental thickness increased by 0.992mm (1cm) by pearson's correlation

There is no significant correlation between the placental thickness and maternal age as shown in Graph – 3

In our study there is no definite correlation between parity and placental thickness. (Table – 8). Test of significant is calculated by unpaired 't' test & P> 0.1775 The P value is not significant.

Placental thickness and parity is considered to be statistically not significant since P> 0.05. Which is consistent with findings of ELCHALAL ET al and DURNWALD et al study.

Habib FA measured the placental thickness of 2cm at 36 weeks as a predictor of IUGR and LBW infants.

In our study none of the cases at 36 weeks had a placental thickness of less than 2cm. Hence we are not able to comment the placental thickness as a predictor of LBW & IUGR.

ELCHALAL et al analysed a thick placental > 4cm or > 90^{th} percentile associated with increased perinatal mortality & morbidity like fetal anomalies, SGA, LGA infants at term**. In our study none of the cases had placental thickness of more than 4cm.**

USES OF PLACENTAL THICKNESS

1. In late 2^{nd} & 3^{rd} trimester where exact duration of pregnancy is not known placental thickness is used to determine gestational age.

2. As a predictor of LBW

3. Prognostic value in diagnosing the occurrence of IUGR

4. At mid pregnancy (18 – 21 weeks) as a predictor of Hb barts disease & reducing the invasive diagnostic procedures.

Accurate determination GA is very important, so that iatrogenic prematurity can be prevented

For elective planned induction of labor management of high risk pregnancy, correct assessment of fetal age is mandatory.

So in some exceptional cases, when normality of any biometry (BPD, FL, AC, HC) is in doubt, gestational age is determined by placental thickness.

LIMITATION OF STUDY

The present study is a cross-sectional study design, which is made up of observations on different individuals, It is not a true placental growth curve as these can only be obtained from serial measurements taken on the same patient throughout gestation. So, it may not provide a clear understanding in individual growth patterns. However, it is a reasonable approximation of a true placental growth curve. Longitudinal placental growth curves can be constructed from serial measurements taken on the same patient throughout pregnancy.

Accuracy of placental measurements depends on making a perpendicular scan of the placenta and care should be taken in acquisition and interpretation of the images to prevent spurious measurements. For e.g., imaging obliquely through the placenta leads to images incorrectly suggesting placental thickening. Images were always acquired at the level of cord insertion as images obtained too near the periphery of the placenta may spuriously suggest thinning. All examination were performed using the same equipment and by the same examiner to minimize these measurement errors.

A method to estimate the thickness of the in-situ placenta from USG images in a single dimension has its own limitations. Placental volume measurement using 3-D USG may more accurately assess placental size than placental thickness measurements. However, 3-D sonography is expensive, time consuming and not widely available.

The parameter of placental thickness may vary among different population groups. Population specific nomograms may be needed or derived from large sample sizes. The placental growth curves may be different for different population groups.

Short placental insertion site may spuriously suggest placental thickening in a normal placenta.

Cord insertion site on the placenta was difficult to image in normal term pregnancies, especially in posterior locations.

SUMMARY

SUMMARY

Diagnostic ultrasound is a non invasive, safe and useful investigative method sought by the obstetrician to clear different dilemmas in obstetrics.

It is an easy & simple method and free from risk to the mother and unborn fetus.

In our study, patients with known LMP were taken & placental thickness measurements were recorded & maturities of the fetus were assessed after birth.

Our study shows that the parity, maternal age shows no significant bearing in the assessment of placental thickness and its correlation to gestational age.

In our study placental thickness increases with advancing gestation matching from 20 to 35 week

The present study has shown a significant correlation between the placental thickness and gestational age particularly in late 2^{nd} and 3^{rd} trimester.

To conclude, one can say the measurement of placental thickness is an important additional parameter for estimation of fetal age along with other fetal biometry.

It is useful in cases where the exact duration of pregnancy is not known Between 20 and 35 weeks, the placental thickness almost matches with gestational age.

Placental thickness can be used as a reliable parameter in late 2^{nd} & 3^{rd} trimester for calculating GA.

CONCLUSION

CONCLUSION

To conclude, one can say the measurement of placental thickness is an important parameter for estimation of fetal age. It is helpful in cases where the exact duration of pregnancy is not known (between 20 and 35 weeks) where the placental thickness almost matches with gestational age.

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ABBREVIATIONS

AC	ABDOMINAL CIRCUMFERENCE
BPD	BIPARIETAL DIAMETER
CRL	CROWN RUMP LENGTH
EGA	ESTIMATED GESTATIONAL AGE
FL	FEMUR LENGTH
HC	HEAD CIRCUMFERENCE
IUGR	INTRA UTERINE GROWTH RETARDATION
LMP	LAST MENSTRUAL PERIOD
PIH	PREGNANCY INDUCED HYPERTENSION
USG	ULTRASONOGRAPHY
EDD	EXPECTED DATE OF DELIVERY
DM	DIABETES MELLITES
SGA	SMALL FOR GESTATIONAL AGE
LGA	LARGE FOR GESTATION AGE
GA	GESTATIONAL AGE
PT	PLACENTAL THICKNESS
MM	MILLIMETER
Hb	HEMOGLOBIN
Rh	RHESUS
LBW	LOW BIRTH WEIGHT

PROFORMA

PROFORMA

PLACENTAL THICKNESS--- FOR ESTIMATION OF GESTATIONAL AGE

Name : Age : Hosp. No :

LMP: EDD: Gestational age(by LMP)

Menstrual History: Regular/Irregular cycles

Obstetric History :

AN/Medical disorders :

USG DETAILS

Presentation:

BPD : mm weeks

AC : mm weeks

FL : mm weeks

Placental thickness:

Placental location :

Any other:

IMPRESSION : LIVE FOETUS WEEKS OF GESTATION

POST NATAL DETAILS;

Gestational age of fetus at birth: Term/ Preterm/ Postterm

BIRTH WEIGHT;

CONSENT FORM

ஒப்புதல் படிவம்

திரு/திருமதி.....

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..... என்ற விலாசத்தில் வசிக்கும் நான் எனக்கு அளிக்கப்பட்ட தகவல் படிவத்தில் உள்ள விவரங்களை படித்தும் கேட்டும் புரிந்து கொண்டேன்.

இந்த ஆய்வின் போது எனக்கு அடி வழியாக ஸ்கேன் செய்து பார்க்க (Transvaginal USG) சம்மதிக்கிறேன். ஆய்வின் முடிவினை சொந்த அடையாளங்களை வெளியிடாமல் மருத்துவ ஆசாய்ச்சிக்காக பயன்படுத்திக்கொள்ள சம்மதிக்கிறேன்.

கையொப்பம்

நாள் :

இடம் :

தகவல் படிவம்

ஸ்டான்லி மருத்துவமனையின் ஆர்.எஸ்.ஆர்.எம். மருத்துவமனையில் மகப்பேறு மற்றும் பெண்கள் நல மருத்துவதுறையில் மேற்கொள்ளப்படும் ஆய்வு தொடர்பான தகவல் படிவம் இது. இந்த ஆய்வு மரு. டாக்டர். ரோஷன் சுலைகா பர்வீன் அவர்களால் மற்றும் பிற அனுபவம் வாய்ந்த மருத்துவர்களின் உதவியோடு நடத்தப்படுகிறது.

இந்த ஆய்வு கருவில் இருக்கும் என் குழந்தையையும் அதன் நஞ்சுக் கொடியின் தடிமானத்தை அல்ட்ரா சவுண்ட் ஸ்கேன் மூலம் பரிசோதனை செய்து கொள்ள முழு மனதுடன் சம்மதிக்கிறேன்

ஸ்கேன் செய்வதன் மூலம் என் கருவில் உள்ள குழந்தையின் உடல் நலத்திற்க்கும், வளர்ச்சிக்கும் எந்த வித பாதிப்பும் இல்லை என்பதை மருத்துவர் மூலம் தெரிந்து கொண்டேன்.

ஒப்புதல் படிவம்

திருமதி.....

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.....என்ற விலாசத்தில் வசிக்கும் நான் எனக்கு அளிக்கப்பட்ட தகவல் படிவத்தில் உள்ள விவரங்களையும் படித்தும் கேட்டும் புரிந்து கொண்டேன்.

ஆய்வன் முடிவினை சொந்த அடையாளங்களை வெளியிடாமல் மருத்துவ ஆராய்ச்சிக்காக பயன்படுத்தி கொள்ள சம்மதிக்கிறேன்

நாள்
கையொப்பம்

இடம் பெயர்

ETHICAL COMMITTEE

INSTITUTIONAL ETHICAL COMMITTEE, STANLEY MEDICAL COLLEGE, CHENNAI-1

Title of the Work : Estimation of the Gestational age of the fetus by ultrasonographic measurement of the thickness of placenta.

Principal Investigator : Dr. Roshan Julaika Parveen

Designation : PG MS (O&G)

Department : Department of Obstetrics & Gynaecology
Government Stanley Medical College,
Chennai-01

The request for an approval from the Institutional Ethical Committee (IEC) was considered on the IEC meeting held on 02.07.2014 at the Council Hall, Stanley Medical College, Chennai-1 at 2PM

The members of the Committee, the secretary and the Chairman are pleased to approve the proposed work mentioned above, submitted by the principal investigator.

The Principal investigator and their team are directed to adhere to the guidelines given below:

1. You should inform the IEC in case of changes in study procedure, site investigator investigation or guide or any other changes.
2. You should not deviate from the area of the work for which you applied for ethical clearance.
3. You should inform the IEC immediately, in case of any adverse events or serious adverse reaction.
4. You should abide to the rules and regulation of the institution(s).
5. You should complete the work within the specified period and if any extension of time is required, you should apply for permission again and do the work.
6. You should submit the summary of the work to the ethical committee on completion of the work.

7/7/14

MEMBER SECRETARY,
IEC, SMC, CHENNAI

MASTER CHART

S.NO	NAME	AGE	HOSP.NO	PARITY	EGA BY LMP (WEEKS)	EGA BY USG (WEEKS)	PT mm	BPD mm	HC mm	AC mm	FL mm	PLACENTAL LOCATION	POST NATAL FOLLOWUP	AS PER GA	BIRTH WT (KG)
1	ANJALI	22	9758	G2P1L1	24	24	24	62	239	199	45	POSTERIOR		TERM	2.7 KG
2	MARIA LOUIS	26	9770	G2P1L1	22	20	20	47	176	153	33	POSTERIOR		TERM	2.8 KG
3	BANU	29	9763	PRIMI	22	22	22	54	201	173	37	ANTERIOR		TERM	2.9 KG
4	AJEESHA	32	9772	G2P1L1	21	21	21	55	204	170	37	ANTERIOR		TERM	2.8 KG
5	NILOFER	28	9738	PRIMI	37	37	36	95	355	362	72	POSTERIOR		TERM	2.7 KG
6	KUMARI	30	9778	G2P1L1	21	21	21	49	188	165	34	ANTERIOR		TERM	2.7 KG
7	KALPANA	26	9465	PRIMI	32	33	32	81	235	204	51	POSTERIOR		TERM	2.6 KG
8	SANGEETHA	28	9642	G2P1L1	21	21	21	48	195	173	35	POSTERIOR		TERM	2.4 KG
9	DURGA	21	9720	G3P2L2	30	30	30	74	277	257	57	ANTERIOR		TERM	2.7 KG
10	BHARATHI	28	9841	PRIMI	39	39	38	91	340	331	73	ANTERIOR		TERM	3.2 KG
11	DHARANI	26	9903	PRIMI	21	21	21	55	208	176	37	ANTERIOR		TERM	2.6 KG
12	SANGEETHA	24	9879	PRIMI	24	24	24	62	239	199	45	POSTERIOR		TERM	2.9 KG
13	SUGANYA	22	9997	PRIMI	21	21	21	48	191	161	36	ANTERIOR		TERM	2.8 KG
14	REVATHI	28	10003	G2P1L1	35	35	35	89	323	308	67	ANTERIOR		TERM	2.7 KG
15	PRAVEENA	28	99957	G3P2L1	37	37	37	87	328	313	70	LATERAL		TERM	3.4 KG
16	PRIYA	30	10024	G2P1L1	37	37	35	90	338	318	71	POSTERIOR		TERM	2.9 KG
17	ANGALESWARI	20	10048	G2P1L1	21	21	21	54	204	170	37	LATERAL		preterm	2.3 KG
18	PRIYADARSHINI	23	10029	PRIMI	21	21	21	51	192	169	37	POSTERIOR		TERM	2.3 KG
19	REENA	32	10069	G2P1L1	21	21	21	47	191	158	36	ANTERIOR		preterm	2.4 KG
20	PARAMESHWERI	31	10112	PRIMI	30	30	30	74	276	257	58	ANTERIOR		TERM	3.0 KG
21	PRIYANKA	22	10113	PRIMI	31	31	31	78	292	262	58	ANTERIOR		TERM	2.4 KG
22	MALINI	24	10120	G2P1L1	20	20	21	52	192	151	33	POSTERIOR		preterm	2.2 KG
23	EZHIL MENAKA	24	10095	PRIMI	24	24	24	62	238	199	45	ANTERIOR		preterm	2.3 KG
24	SANDHYA	24	10135	PRIMI	23	23	24	54	204	183	39	POSTERIOR		TERM	2.3 KG
25	SANDHYA	28	10203	G2P1L1	21	21	21	52	195	150	34	POSTERIOR		TERM	2.8 KG
26	SUJANA	32	10242	PRIMI	22	22	22	54	202	173	37	POSTERIOR		TERM	3.0 KG
27	SASIKALA	30	10343	G2P1L1	32	32	33	81	308	284	65	POSTERIOR		TERM	2.9 KG
28	BHUVANESWARI	24	10402	G3P2L2	28	28	29	76	277	235	53	FUNDAL		TERM	2.7 KG
29	KOTEESWARI	24	10607	G2P1L1	35	35	35	89	322	308	67	POSTERIOR		TERM	2.6 KG
30	CLARA	30	10790	PRIMI	20	20	20	49	189	157	32	ANTERIOR		TERM	2.6 KG
31	DURGADEVI	26	10831	PRIMI	21	21	21	53	190	151	34	ANTERIOR		TERM	2.7 KG
32	MALARVIZHI	25	10826	G3P1L1A1	20	21	21	48	204	170	34	ANTERIOR		TERM	2.7 KG
33	KALAIVANI	20	10840	PRIMI	26	26	26	67	240	210	50	ANTERIOR		TERM	2.8 KG
34	SULTHANA	21	10898	PRIMI	23	23	23	54	205	183	39	ANTERIOR		TERM	2.7 KG
35	DURGA	20	10933	PRIMI	35	36	36	90	324	303	67	POSTERIOR		TERM	2.9 KG
36	PONMANI	26	10975	PRIMI	32	33	33	81	235	204	51	LATERAL		TERM	2.8 KG
37	INDRA	27	11015	G2P1L1	37	37	34	89	338	320	73	ANTERIOR		TERM	2.8 KG
38	KAMATCHI	23	11088	G2A1	21	21	21	55	197	165	36	LATERAL		TERM	2.7 KG
39	KALA	24	11117	G2P1L1	35	35	35	90	322	308	71	ANTERIOR		TERM	2.8 KG
40	PRIYADARSHINI	24	11154	PRIMI	35	35	33	82	310	300	67	ANTERIOR		TERM	2.8 KG
41	SAMUNDEESWARI	21	11252	PRIMI	20	20	21	47	182	157	34	POSTERIOR		TERM	2.4 KG
42	MAHALAKSHMI	20	11377	PRIMI	20	20	20	47	176	153	33	POSTERIOR		TERM	2.6 KG
43	MEHMOODA	20	11480	PRIMI	24	24	24	62	239	199	45	POSTERIOR		TERM	2.7 KG

S.NO	NAME	AGE	HOSP.NO	PARITY	EGA BY LMP (WEEKS)	EGA BY USG (WEEKS)	PT mm	BPD mm	HC mm	AC mm	FL mm	PLACENTAL LOCATION	POST NATAL FOLLOWUP	AS PER GA	BIRTH WT (KG)
44	REVATHI	29	11431	PRIMI	25	25	26	66	240	207	48	ANTERIOR		TERM	2.7 KG
45	JANNATH	33	11445	G3P2L2	23	23	23	54	205	182	40	ANTERIOR		TERM	2.4 KG
46	KUPPAMMA	23	11690	PRIMI	33	33	33	80	309	284	64	ANTERIOR		POST TERM	3.4 KG
47	NAZREEN	28	11708	G2P1L1	34	34	33	84	310	284	66	FUNDAL		TERM	2.8 KG
48	KAVITHA	26	11754	G2P1L1	36	36	35	91	326	312	71	ANTERIOR		TERM	2.9 KG
49	RACHAEL	24	11749	G2P1L1	29	29	28	74	277	261	56	ANTERIOR		TERM	2.8 KG
50	MEHBOOBA	25	11763	G2P1L1	30	32	30	74	276	258	57	ANTERIOR		PRETERM	2.2
51	MAHALAKSHMI	24	11789	G2P1L1	27	27	28	67	251	239	51	POSTERIOR		TERM	2.7
52	DHANALAKSHMI	20	11818	PRIMI	29	29	28	74	277	261	56	LATERAL		TERM	3
53	GEETHA	22	11845	G2P1L1	36	36	35	91	326	312	71	FUNDAL		TERM	3.3
54	FATHIMA	22	11859	G2P1L1	39	39	38	90	340	334	74	FUNDAL		TERM	
55	THAMEENA	26	11920	G2P1L1	22	22	20	47	177	153	33	FUNDAL		TERM	2.7
56	SHALINI	29	11947	G2P1L1	22	22	22	54	202	173	37	ANTERIOR		TERM	2.8
57	SIVAKAMI	32	11985	G2P1L1	29	28	29	74	277	261	56	ANTERIOR		TERM	2.8
58	SANDHYA	28	11965	G2P1L1	37	37	36	95	356	362	69	FUNDAL		POSTTERM	3.4
59	SARADHA	21	11957	G2P1L1	30	30	30	74	278	257	57	ANTERIOR		TERM	2.7
60	RATHINAM	27	11967	G2P1L1	39	39	38	91	341	333	73	ANTERIOR		TERM	3.6
61	NATCHIARRAMA	25	11855	PRIMI	21	21	21	48	192	161	136	ANTERIOR		TERM	2.7
62	JANAKI	24	12074	PRIMI	24	24	24	62	238	199	45	POSTERIOR		TERM	2.8
63	PAVITHRA	22	12107	PRIMI	21	21	21	48	192	161	36	POSTERIOR		TERM	3.8
64	FATHIMA	28	12093	G2P1L1	26	26	26	67	240	210	18	ANTERIOR		TERM	2.6
65	SUDHA	27	12098	G4P2L1A1	35	37	37	34	329	313	70	LATERAL		PRETERM	2.3
66	RAJESWARI	30	11968	G2P1L1	37	37	36	90	324	318	71	POSTERIOR		TERM	2.7
67	SANGEETHA	21	12312	PRIMI	21	21	21	34	193	169	37	LATERAL		PRETERM	2.3
68	SIVAGANI	24	12227	G2P1L1	21	21	21	34	200	170	37	LATERAL		TERM	2.8
69	PRIYA	23	12365	PRIMI	31	31	31	34	293	262	58	ANTERIOR		TERM	2.9
70	SATHYA	25	12428	G3P2L2	20	20	21	34	193	151	33	POSTERIOR		TERM	2.8
71	SHANTHI	25	12488	PRIMI	39	38	38	91	341	333	73	ANTERIOR		TERM	3.7
72	MARIYAM	29	12704	G2P1L1	21	21	21	34	196	150	34	POSTERIOR		TERM	2.8
73	USHARANI	33	13953	PRIMI	33	34	33	88	338	219	73	POSTERIOR		TERM	3.2
74	THULASI	31	14083	G2P1L1	32	33	32	80	309	284	65	ANTERIOR		TERM	3.6
75	RAJESWARI	25	14326	G2P1L1	35	35	35	88	323	308	67	POSTERIOR		TERM	2.8
76	VASANTHI	31	14337	PRIMI	20	21	20	53	204	169	37	ANTERIOR		TERM	2.8
77	MOHANA	26	14679	G3P1L1A1	20	21	21	34	205	170	36	ANTERIOR		IUGR	2
78	JEYANTHI	21	14892	PRIMI	26	26	26	67	241	210	50	ANTERIOR		TERM	2.6
79	THENMOZHI	22	15311	PRIMI	23	22	23	54	205	184	39	ANTERIOR		TERM	2.8
80	KAMATCHI	22	15832	PRIMI	35	35	35	89	322	308	67	POSTERIOR		TERM	3.7
81	SHEELA	27	15846	PRIMI	32	33	32	81	308	284	65	LATERAL		TERM	2.7
82	RAMEESA	28	15975	G2P1L1	37	37	35	95	356	362	73	ANTERIOR		PRETERM	2.5
83	LALITHA	24	16641	G2P1L1	21	21	21	34	198	165	36	LATERAL		TERM	2.8
84	AMULU	25	16652	G2P1L1	35	35	35	89	329	313	71	ANTERIOR		TERM	3.8
85	DEVI	25	16375	PRIMI	34	34	332	82	310	300	67	ANTERIOR		TERM	3.2
86	NANDHINI	22	16404	PRIMI	20	20	21	34	183	156	34	POSTERIOR		TERM	3.6

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87	RONI	21	16601	PRIMI	20	20	20	34	176	158	34	POSTERIOR		TERM	2.8
88	AMSAVALLI	21	16702	PRIMI	24	26	24	63	237	198	45	POSTERIOR		TERM	2.7
89	DIVYA	30	16753	PRIMI	26	26	26	34	242	207	48	ANTERIOR		TERM	2.8
90	SUMATHI	34	16584	G3P2L2	39	38	37	89	339	334	74	ANTERIOR		POSTTERM	3.6
91	MALARKODI	24	16944	PRIMI	33	33	33	80	310	285	64	ANTERIOR		TERM	2.7
92	POOVIZHI	29	17007	G2P1L1	34	34	33	83	311	284	66	FUNDAL		TERM	3.4
93	SARITHA	27	17099	G2P1L1	36	36	34	92	327	312	71	ANTERIOR		TERM	2.6
94	SUGANYA	25	17020	PRIMI	22	21	22	48	178	154	37	ANTERIOR		TERM	2.7
95	BANUPRIYA	26	17328	G2P1L1	30	30	30	74	278	257	27	POSTERIOR		TERM	2.8
96	GOWTHAMI	25	17112	G2P1L1	27	27	28	34	252	239	51	POSTERIOR		TERM	2.7
97	TAMILARASI	21	17349	PRIMI	29	29	28	34	278	261	56	LATERAL		TERM	3.3
98	NITHYA	23	17308	G2P1L1	31	32	31	77	293	262	58	POSTERIOR		TERM	2.7
99	SANGEETHA	20	17553	G2P1L1	36	36	35	34	327	312	71	FUNDAL		TERM	3.4
100	PONNI	27	17661	G2P1L1	22	22	20	34	178	153	33	POSTERIOR		TERM	2.8
101	SUBASHINI	27	17733	PRIMI	22	22	22	34	203	173	37	ANTERIOR		TERM	2.7
102	LALITHA	30	17815	G2P1L1	31	30	31	77	293	262	58	ANTERIOR		IUGR	2.2
103	BABY	26	17804	PRIMI	37	37	36	90	324	303	67	POSTERIOR		TERM	2.8
104	SELVI	20	18086	G2P1L1	30	32	30	74	276	258	57	ANTERIOR		TERM	2.97
105	VALARMATHI	25	18142	PRIMI	39	39	38	90	340	334	74	ANTERIOR		TERM	3.3
106	AMUDHA	23	18182	PRIMI	21	21	21	47	191	162	36	ANTERIOR		IUGR	2.1
107	SHALINI	22	30	PRIMI	24	24	24	63	237	200	45	POSTERIOR		TERM	2.8
108	SUMATHI	20	29	PRIMI	21	21	21	48	192	163	36	POSTERIOR		TERM	2.7
109	THENMOZHI	26	44	G2P1L1	27	28	26	68	252	239	51	ANTERIOR		TERM	2.5
110	VANITHA	25	58	G3P2L2	35	37	35	88	328	311	70	LATERAL		TERM	2.6
111	MUTTHA	28	69	G2P1L1	21	21	21	47	204	169	37	LATERAL		TERM	2.7
112	RAJATHI	20	95	PRIMI	21	21	21	46	192	170	37	LATERAL		TERM	2.8
113	RAMADEVI	22	28	PRIMI	31	31	31	77	293	261	58	ANTERIOR		TERM	2.9
114	SARANYA	23	130	G3P2L2	20	20	21	47	192	150	33	POSTERIOR		TERM	2.7
115	NITHYA	23	170	PRIMI	20	22	20	47	176	153	33	POSTERIOR		TERM	2.8
116	ILAKIYA	27	202	G2P1L1	21	21	21	47	195	149	34	POSTERIOR		TERM	3.2
117	KOKILA	32	314	PRIMI	22	22	22	54	201	173	37	POSTERIOR		TERM	3.3
118	MARIAMMAL	30	365	G2P1L1	32	32	32	74	308	283	65	POSTERIOR		TERM	3.1
119	SELVI	26	424	G2P1L1	28	28	28	48	277	234	53	FUNDAL		TERM	3.2
120	MANIMEGALAI	24	472	G2P1L1	35	35	35	89	322	309	67	POSTERIOR		TERM	3.1
121	RAMYA	29	523	PRIMI	20	20	20	54	189	156	32	ANTERIOR		TERM	3
122	NIROSHA	25	546	G2P1L1	20	21	21	47	204	171	34	ANTERIOR		TERM	3.2
123	LAKSHMI	19	554	PRIMI	26	26	26	81	240	211	50	ANTERIOR		TERM	3.3
124	GAYATHRI	20	653	PRIMI	23	23	23	54	205	184	39	ANTERIOR		TERM	3
125	SARANYA	19	755	PRIMI	35	36	35	90	324	302	67	POSTERIOR		TERM	2.9
126	SUNDARAVALLI	25	824	PRIMI	33	33	33	80	235	203	51	LATERAL		TERM	3.1
127	BANU	27	860	G2P1L1	37	37	36	95	338	219	73	ANTERIOR		TERM	3.2
128	PAVITHRA	22	889	G2A1	21	21	21	47	196	165	36	LATERAL		TERM	3.2
129	MARUTHAMMA	23	978	G2P1L1	35	35	35	90	321	308	71	ANTERIOR		TERM	3

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130	JANSI	23	996	PRIMI	35	35	35	90	309	300	67	ANTERIOR		TERM	3.3
131	VANITHA	20	1046	PRIMI	20	20	21	47	181	157	34	POSTERIOR		TERM	3.4
132	NANDHINI	19	1055	PRIMI	20	20	20	52	175	153	33	POSTERIOR		TERM	3.3
133	ASINA	20	1127	PRIMI	24	24	24	62	238	199	45	POSTERIOR		TERM	2.6
134	ARIVUPRIYA	28	1141	PRIMI	26	26	26	67	239	207	48	ANTERIOR		TERM	2.7
135	ANEES	32	1165	G3P2L2	23	22	23	54	197	165	36	ANTERIOR		TERM	2.8
136	KALVI	22	1205	PRIMI	33	33	33	84	308	284	64	ANTERIOR		TERM	2.7
137	GAYATHRI	27	1368	G2P1L1	34	34	34	84	309	283	66	FUNDAL		TERM	2.5
138	HEMAVATHY	25	1349	G2P1L1	27	26	27	67	251	239	51	ANTERIOR		TERM	2.6
139	HASEENA	23	1624	PRIMI	29	28	29	74	277	142	29	ANTERIOR		TERM	2.4
140	SARATHA	24	2257	G2P1L1	25	25	26	67	240	50	27	POSTERIOR		TERM	2.9
141	DHANAKODI	24	2208	G2P1L1	27	27	28	34	251	239	51	POSTERIOR		TERM	2.7
142	PREMA	20	2380	PRIMI	29	29	28	34	275	261	56	LATERAL		TERM	2.8
143	SIVAGAMI	22	2611	G2P1L1	37	37	36	88	338	220	73	POSTERIOR		TERM	2.7
144	SANDHIYA	19	2651	G2P1L1	35	35	35	82	326	312	71	FUNDAL		TERM	2.6
145	RANGEELA	26	2364	G2P1L1	21	21	20	47	177	153	33	POSTERIOR		TERM	2.7
146	ARUNA	26	2579	PRIMI	22	22	22	47	178	154	37	ANTERIOR		TERM	2.9
147	RANJITHA	29	2882	G2P1L1	21	21	21	54	196	166	36	ANTERIOR		TERM	2.7
148	SUMAIYA	25	5169	PRIMI	37	37	36	86	338	220	73	POSTERIOR		TERM	2.7
149	SHANTHI	19	5274	G2P1L1	30	30	30	73	275	258	57	ANTERIOR		TERM	2.6
150	SUSEELA	24	5271	PRIMI	39	39	38	89	339	334	74	ANTERIOR		TERM	2.9
151	SUBATHRA	22	5344	PRIMI	21	21	21	47	180	161	36	ANTERIOR		TERM	2.5
152	NEELAVATHY	21	5514	PRIMI	24	24	24	62	236	200	45	POSTERIOR		TERM	2.9
153	ASHWINI	19	5564	PRIMI	21	21	21	47	192	163	36	FUNDAL		TERM	2.8
154	METHA	25	5647	G2P1L1	30	30	30	73	275	258	57	ANTERIOR		TERM	2.4
155	SUREKHA	24	5350	G3P2L2	35	37	35	91	327	311	71	LATERAL		TERM	2.6
156	SIVARANJANI	28	6051	G2P1L1	21	21	21	46	204	170	37	LATERAL		TERM	2.8
157	ANJALI	20	6390	PRIMI	21	21	21	44	192	171	37	LATERAL		TERM	2.8
158	VALLI	22	6556	PRIMI	31	31	31	77	293	262	58	ANTERIOR		TERM	2.7
159	REVATHY	23	6795	G3P2L2	20	20	21	54	192	151	33	POSTERIOR		TERM	2.5
160	KUMUDA	23	6927	PRIMI	23	23	23	54	205	185	39	POSTERIOR		TERM	2.8
161	PREMA	27	7297	G2P1L1	21	21	21	47	195	50	34	FUNDAL		TERM	2.9
162	SHARMILA	32	7057	PRIMI	26	26	26	67	240	212	50	POSTERIOR		TERM	2.7
163	DILLI	30	6168	G2P1L1	32	32	32	80	308	284	65	POSTERIOR		TERM	2.6
164	KARPAGAM	26	7284	G2P1L1	28	28	28	75	277	235	53	FUNDAL		TERM	2.8
165	JEYANTHI	23	7321	G2P1L1	35	35	35	34	322	310	67	FUNDAL		TERM	2.9
166	REVATHI	27	7341	PRIMI	20	20	20	22	189	157	32	ANTERIOR		TERM	2.7
167	KASTHURI	24	7365	G2P1L1	20	21	21	44	204	172	34	ANTERIOR		TERM	2.8
168	SANNA	19	7278	PRIMI	26	26	26	67	240	212	50	ANTERIOR		TERM	2.7
169	HASEENA	21	7684	PRIMI	23	23	23	54	205	185	39	ANTERIOR		TERM	2.8
170	TAMILSELVI	19	7559	PRIMI	36	36	34	90	324	303	67	POSTERIOR		TERM	2.7
171	NITHYA	25	8039	PRIMI	33	33	33	80	235	204	51	LATERAL		TERM	2.7
172	TAMILSELVI	28	8772	G2P1L1	37	37	36	88	338	220	73	ANTERIOR		TERM	2.9

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173	SENGANI	22	8157	PRIMI	21	21	21	46	196	166	36	LATERAL		TERM	2.7
174	DHANALAKSHMI	23	8214	G2P1L1	35	35	35	75	321	309	71	ANTERIOR		TERM	2.8
175	JEYAPRIYA	23	8230	PRIMI	35	35	35	75	309	301	67	ANTERIOR		TERM	2.7
176	SHENBAGAM	20	8263	PRIMI	20	20	21	47	181	158	34	POSTERIOR		TERM	2.8
177	MEENA	19	8509	PRIMI	20	20	20	22	175	153	33	POSTERIOR		TERM	2.7
178	SANDHIYA	20	8468	PRIMI	24	24	24	39	238	199	45	POSTERIOR		TERM	2.8
179	VALLIAMMAL	28	8226	PRIMI	26	26	26	65	239	208	48	ANTERIOR		TERM	2.7
180	GOMATHI	32	8650	G3P2L2	24	24	24	61	238	199	45	ANTERIOR		TERM	2.7
181	RADHIKA	22	8731	PRIMI	33	33	33	83	308	285	64	ANTERIOR		TERM	2.6
182	BHARATHI	27	8793	G2P1L1	34	34	33	84	309	284	66	FUNDAL		TERM	2.7
183	NANDHINI	25	7919	G2P1L1	39	39	38	90	340	334	74	ANTERIOR		TERM	2.8
184	DURGA	23	8857	PRIMI	31	31	31	77	293	261	58	ANTERIOR		TERM	2.7
185	BAVANI	24	8674	G2P1L1	33	33	33	79	308	285	64	POSTERIOR		TERM	2.5
186	SALIHA	24	8456	G2P1L1	27	27	27	67	251	239	51	POSTERIOR		TERM	2.7
187	SANGITHA	20	8492	PRIMI	28	28	28	74	275	262	56	LATERAL		TERM	2.9
188	SAMSATH	23	8749	G2P1L1	25	25	26	66	240	207	48	FUNDAL		TERM	2.8
189	MAMTHA	19	8820	G2P1L1	35	35	35	34	326	312	71	FUNDAL		TERM	2.8
190	RADHA	26	8830	G3P1L1A1	21	21	20	52	177	154	33	FUNDAL		TERM	2.7
191	PRATHIBA	28	8684	PRIMI	22	22	22	54	178	155	37	ANTERIOR		TERM	2.9
192	MAIMOONA	22	8890	PRIMI	32	32	32	80	228	294	63	ANTERIOR		TERM	2.7
193	SAHIRA	19	9120	PRIMI	22	22	24	54	195	168	40	ANTERIOR		TERM	2.8
194	REKHA	34	9345	G2P1L1	34	34	34	89	305	292	70	FUNDAL		TERM	2.7
195	SUJATHA	26	9555	G2P1L1	37	37	36	96	354	363	72	ANTERIOR		TERM	2.8
196	SHEELA	22	9672	PRIMI	32	32	32	80	308	284	65	POSTERIOR		TERM	2.9
197	THENDRAL	24	9698	G2P1L1	21	21	21	51	196	166	36	POSTERIOR		TERM	2.7
198	AKILA	20	9721	PRIMI	21	21	21	51	192	165	37	LATERAL		TERM	2.7
199	RAHEEMA	23	9765	G2P1L1	28	28	29	76	278	235	53	POSTERIOR		TERM	2.8
200	SANGAVI	21													